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ABSTRACT

This environmental resource guide consists of objectives for grades 7-12 and activities for juniors and seniors in high school. The environmental objectives include understanding the following concepts: (1) interdependency in nature; (2) finite resources; (3) wise use of resources; (4) change; and (5) man's environmental responsibility. The activities are divided into two sections: (1) natural resources - water, air, land, and energy; and (2) population patterns - population problems, pollution. Each activity consists of a title, objectives, procedures, suggestions for teachers, and a credit line. (Author/RH)

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COLUMBIA COUNTY ENVIRONMENTAL RESOURCE GUIDE, GRADES 7-12

SE 024 767

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C O N T E N T S

I. Scope Goals

II. Sequence

Kindergarten: page 1

Objectives

Activities

First Grade: page 6

Objectives

Activities

Second Grade: page 14

Objectives

Activities

Third Grade: page 28

Objectives

Activities

Fourth Grade: page 34

Objectives

Activities

Fifth Grade: page 47

Objectives

Activities

Sixth Grade: page 86

Objectives

Activities

III. Suggested Resources People

IV. References

V. List of free and inexpensive instructional material

SEQUENCE

Kindergarten

Objectives:

1. To become aware of his environment.
2. To become aware that his environment affects him.
3. To become aware that he is part of his environment.
4. To become aware of how the natural environment serves as inspiration for the creative arts.

Title: Home & School Environment

Objectives: 1,2,3

Materials: crayons, paper

Teaching Suggestions: On different occasions let each child draw a picture of himself, his home and his school. Let each child describe his picture. Define environment and explain that their home, their school, and their town is part of their environment.

Title: Elements of the Natural Environment

Objectives: 1,2,3

Material: Natural area to walk in, construction paper

Teaching Suggestions: Plan a nature walk. Before leaving remind them to observe everything with their senses. When the children return to the classroom they may close their eyes while the teacher asks them to name everything they remember. List them on chalkboard under one of these headings-see, hear, feel, smell.

1. Have children make a booklet about the things they saw by using magazines and drawing pictures.

2. On a nature walk have each child collect something to be pasted on a group paster. Discuss likenesses and differences.

3. Go outside and name all the colors you see, find the tallest and shortest tree, name as many different sounds as you can, name as many different odors as you can, find 10 different insects, describe a cloud, describe the biggest object you can find, draw a blade of grass.

4. Go outside and measure with any kind of unit the child desires a blade of grass, distance around a tree, an ant, a classmate's shoe, distance between a building and the nearest tree, distance a friend can jump, three different leaves (largest smallest), how far a student can run while a friend counts to 3, the smallest object we can find.

Title: How does the sun affect anything in it's light?

Objectives: 1,2

Materials: None

Teaching Suggestions: Guide discussion of concepts with these questions: Where is the warmest place on the school grounds? Where is the coolest place? What are the similarities and differences in plants growing in each place? Name five cool objects and five warm objects. How do you feel in a hot, warm or cool place?

Title: Life, Plants, & Animals

Objectives: 1,2,3

Materials: None

Teaching Suggestions: Discuss the three basic needs of all living things. Explain that certain things are not necessary, but food, water and air are essential to life. Compare man's needs to the needs of other living things. Discuss how man's basic needs include shelter and clothing, whereas nature makes other provisions for animals.

Title: Changing of Seasons

Objective: 1,2,

Materials: Pictures to depict 4 seasons

Teaching Suggestions: Children will describe and discuss the four seasons as they occur in North Florida and other geographic areas. Discuss what kind of clothes we wear in each type of season and it's corresponding weather conditions. Discuss what we do on a hot day, cold day, rainy day, etc. Emphasize the changes which occur to animals and people as well as plants, such as food we eat, thickness of animals fur.

1. Have a student draw pictures of their favorite type of weather.

2. Observe the sky and predict the weather.

3. Have children listen to weather report and return to class and give the days weather.

Title: Noise

Objective: 1,2,3

Materials: tape recorder

Teaching Suggestions: Take students to several listening places. Have students describe the sounds in each area. Record the sounds in each area. Compare the sounds that are pleasant and unpleasant. Rank the sounds in order from the most pleasant to the most unpleasant. Discuss how noise affects living things and how noise can be changed or eliminated.

Title: People Space
Objectives: 1,2,3
Materials: Open space

Teaching Suggestions: Divide class into 4 groups. Choose an open area that you think is big enough to play in comfortably. Mark if off with rope and have one group play for a few minutes within those boundaries. Then ask a second group to come and play. After several minutes stop the game and have everyone sit down and think about what happened. Discuss. Did any group have to change the way they played? Did everybody like having so many people in your space? Did you get noisy? What happened to people's tempers?

Title: Beauty of Man's Environment
Objectives: 1,4
Materials: Series of prints of famous masterpieces, tempera paint, brushes, newsprint.

Teaching Suggestions: Show the students a series of famous masterpieces. Have the children express what they think is beautiful in the prints. Have each child pretend that one of the "masters of the art world" returned to our town. What would you select as the most beautiful thing or place in your town for this great master to paint? Paint a picture of it to share with the class.

Title: Beauty of Shells
Objectives: 1,4
Materials: Shells, glue, shallow cardboard box, small dried plants, modeling clay, plastic film (saran wrap)

Teaching Suggestions: 1) Put clay in the bottom of the shallow box, press shells into the clay and make a creative arrangement. Dried plants may be added. Cover top with plastic wrap. 2) Make necklace or other jewelry from shells or other natural materials. 3) Decorate boxes to be used as trinket boxes, ash trays, pencil holders with shells or other natural materials.

Materials: From the natural environment identify certain elements that are constantly in motion. For example: moving water, trees in the wind, or a storm, leaves falling from trees, clouds during a storm, etc.

Sequence

First Grade

Objectives:

1. To develop an awareness of the immediate natural environment - plants, animals, rocks, air, water, and soil found at school, in the neighborhood, or in the community.

2. To develop an awareness of change in the natural world - how sizes, shapes, colors, sounds, smells, textures, and animal activities vary with the seasons.

3. To understand some of the interrelationships among soil, plants, animals, people, water, and air.

4. To learn how people depend on soil, water, plants, animals, and air and why people must know how to take care of them properly.

5. To learn what people can do to make their environment cleaner, more healthful, and more beautiful.

6. To develop awareness of how the natural environment serves as inspiration for the creative arts.

Title: Beauty Walk
Objectives: 1
Materials: None

Teaching Suggestions: 1) Take a walk outside and look for something beautiful. Point out beautiful things to students having difficulty. Some may wish to pick up something beautiful to keep. Be sure it won't take away some of the beauty of the environment. Let each child tell you what he sees that is beautiful. 2) Sit in a grassy place and have children close their eyes and listen for beautiful sounds. At the count of three imitate the sound. Let them name the beautiful sound they hear. Tell why they think the sound is beautiful.

Title: Our Poem
Objectives: 1
Materials: Chart paper and pen

Teaching Suggestions: 1) When the class returns from activity Number 1, record some of the beautiful things the students found. Write a poem by completing the following:

Beautiful is a green leaf
Beautiful is a tall tree
Beautiful is a singing bird.

Use tape recorder to record sounds made by students and then have them guess what the sounds were.

Title: Our Beautiful World
Objectives: 3
Materials: Art paper, pencils, magazines, scissors, paste

Teaching Suggestions: Draw pictures or cut out pictures to illustrate beauty in the world of nature. Make a bulletin board display.

Title: Mini-Forest
Objectives: 1
Materials: none

Teaching Suggestions: Lie on the ground, face down. Make a circle by stretching your arms out in front of you on the ground. Find at least five different plants inside that circle made with your arms. See if you can find tiny animals crawling through the grass. What else do you see? Spread the grass apart and describe what you see. Good for an out-of-the way area in a school yard.

Title: Seeds make plants
Objectives: 2
Materials: seeds, lima beans, wheat, sunflower, magnifying glass, bowl and water

Teaching Suggestions: There are 3 parts to each seed: the seed coat, a baby plant, and some stored food. The baby plant will grow by "eating" or using the stored food in the seed. Does it take a long time for a baby plant to grow from a seed? Do all plants grow from seeds at the same rate? Soak the lima bean overnight, then look for the scar on the side of the bean. The scar shows where the bean was attached to the inside of the bean pod. Slip the seed coat off the bean. Split the inner bean into two parts. Attached to half of the bean is a very tiny plant. Use the magnifying glass to find where the roots, a stem, and leaves grow from this plant. Try the same thing with other kinds of seeds. Does the baby plant always look the same?

Title: Some Animals Change When the Seasons Change
Objective: 2
Materials: Live frog, ice, grasshopper, deep container of water, bottle with cap.

Teaching Suggestions: Some grow heavier coats of fur in the fall, some change color, some store food for the winter, and some change their homes.

Place the frog in the water. Gradually add ice so the water slowly lowers. The frog should become less active as its body temperature drops nearer to that of the water. When the frog becomes quite still, take it from the water and place it where it can warm slowly. What happens as the body temperature rises? Place the grasshopper in the bottle and put the cap on the bottle. Lower the bottle into the ice water for some time. Does the insect respond as the frog did to the lowered temperature? It should.

Title: Some Birds Who Do Not Migrate Have a Hard Time Finding Food in the Winter
Objective: 2
Materials: suet, coarse mesh bag or open soap dish, string, large pine cones, peanut butter, bread crumbs, bits of nuts, oatmeal, etc.

Teaching Suggestions: 1) Put the suet in the mesh bag and tie the top securely. Hang it from a tree limb or place the suet in the soap dish. Tie the soap dish to the trunk of a tree. Observe from a distance what birds come to eat. 2) Spread peanut butter on the pine cone. Sprinkle with oatmeal, crumbs, nuts, etc. Attach to tree. This could be used as a Christmas project - A gift for bird friends.

Title: Ant Hill Observation
Objective: 3
Materials: several crumbs, or sugar

Teaching Suggestions: 1) Take class outside and locate several ant hills. Place some crumbs around the ant hill.

Observe such things as:
a. How long did it take the ants to locate the crumbs?
b. How many ants tried to help carry 1 crumb?
c. How do they manage the movement?
d. How long does it take to get the crumbs inside the ant hill?
e. How many ants enter the ant hill?
f. How many ants leave the ant hill?

Title: Ant Farm
Objective: 3
Materials: Large glass container, small aquarium, 1 gallon large mouth jar, 1 quart jar, cover for top or pan of water to set container in, black paper and string, soil or sand for container.

1) Ask questions to help organize information already observed or discussed concerning ants. Some questions could be:
a. How do ants act like bulldozers?
b. How does this help plants? (loosen the soil, so that water can get to the roots).
c. Is it dark inside an ant hill?
d. Do ants need food and water?
e. Where do you get food and water?
f. If we bring ants inside our class, what will we have to do? Discuss preparations needed. Make a list of things to do and things to get.
g. Set up the ant farm complete except for ants. Where will the ants get food? water? How can we see their tunnels? (Black paper around container).
2) Go outside and find an ant hill. Dig down deeply and get all the gravel and sand around the ant hill. Place immediately in container. Try to get the winged ant as she is the queen. Place cover on ant farm or set in pan of water. Place black paper around container.
3) Take black paper away after several days and observe tunnels. Replace black paper when not observing.

Title: Dependency on Natural Resources
Objective: 4
Materials: none

Teaching Suggestions: For a period of two or three days, have students make a list of things they do, such as eat breakfast, come to school, work in the garden, deliver newspapers, look at television, etc. Then have pupils list for each one of the activities (orally) the things they used: 1) that come from the earth 2) that grow in soil 3)that came from animals which depend on plants 4) that need water to grow.

Title: Campus Survey
Objective: 5
Materials: drawing of school campus on chalkboard

Pretest: Count litter on classroom floor at end of day

Teaching Suggestions: Ask the class some leading questions about locations of trash cans around the school. Example:
1. Where do you put trash in the room?
2. If you were on the playground, where would you put trash?
3. Suppose you were waiting for the school bus, where would you put trash?
4. Where does Mr. (the custodian) put all the trash from the school?
5. How many containers are placed outside?
6. Are there enough trash cans placed outside the school?

Continue immediately after questions. Draw a map of the school grounds on the chalkboard. Ask how many would like to make a survey of how many trash cans are located outside and where they are. Have one student take a pencil and pad to be a recorder. Also look for the place that has the most litter. When the group returns, mark on the map where the cans are located. Locate on the map the areas that have the most litter. Are there enough cans in those areas? If the group feels more trash cans are needed, write a letter to the principal giving reasons for the suggestions of more trash cans.

Think about the possibility of the class painting the cans a bright color. This could be a class project.

Title: Litterbug - Neaterbug
Objective: 5
Materials: none

Teaching Suggestions: Teach the children the song "Litterbug-Neaterbug" to the tune of Did you Ever See a Lassie?

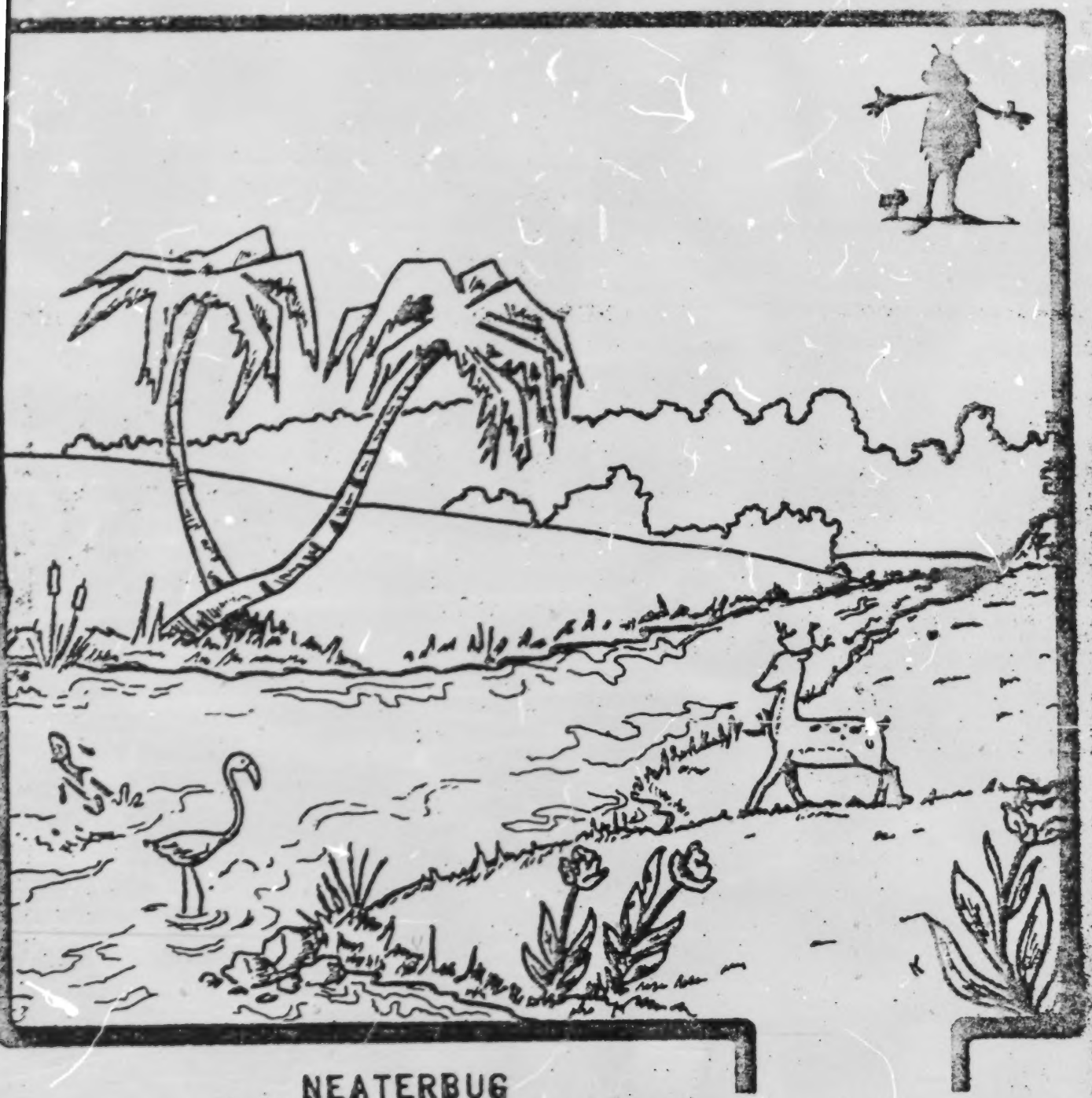
Oh, here comes a litterbug, a litterbug, a litterbug,
Oh, here comes a litterbug, just see what he will do.
I don't want to be a litterbug, a litterbug,
I don't want to be a litterbug, and neither do you.
Oh here comes a neaterbug, a neaterbug, a neaterbug,
Oh, here comes a neaterbug, just see what he will do.
Oh, I want to be a neaterbug, a neaterbug, a neaterbug,
and so do you.

Post test - Litter count - compare and discuss

LITTERBUG

Oh here comes a litterbug
Just see what he will do.
Oh I don't want to be a litterbug
And neither do you !

#8



NEATERBUG

Oh here comes a neaterbug
Just see what she will do.
Oh I want to be a neaterbug
And so do you !

Title: Pollution
Objective: 5
Materials: Two art worksheets, 4a and 4b, crayons

Teaching Suggestions: Divide the class into 2 equal groups. Give one group the Litterbug worksheet and the other group the neaterbug worksheet. Read the poem. After the pictures are finsished, display them on the Bulletin Board. Ask: Where would you rather be? Why? Which picture happened first?

Title: Leaf Prints
Objectives: 1, 6
Materials: Shoe polish, paste, paper, large spool

Teaching Suggestions: Rub the surface of the leaf with a little shoe polish paste. Then place it on a sheet of paper, polish side down. Put another sheet of paper over it. Press the "sandwich" firmly with a roller (the side of a smooth bottle will do) or with the heel of a large spoon, to make the print.

SEQUENCE

Second Grade

Objectives:

1. To increase awareness of change and interrelationships within the natural environment.

2. To develop an awareness of people as a part of the natural world and their role in changing the environment.

3. To understand how soil is formed.

4. To understand how the life of a plant or animal is affected by its environment.

5. To understand how animals depend directly or indirectly on food from green plants for energy and growth.

6. To understand how people depend on each other and on soil, water, plants, animals, and air.

7. To increase awareness of how the natural environment serves as inspiration for the creative arts.

Activity: Likes and Dislikes
Objective: 1
Materials: none

Teaching Suggestions:

1. Students tour the campus to find one living thing they like and one non-living thing they like. They also find one thing in each category they dislike.

2. In class, students tell what they have found and why they like or dislike the object. Other students may feel differently from the way one student feels and should express themselves. Show the students that expressing themselves with others is a good way to show living things interdepend.

Activity: Leaf Variations
Objective: 1
Materials: Graph paper, pencil, leaf from the same tree for each student.

Teaching Suggestions:

1. Each student is given a piece of graph paper and a leaf.

2. With their pencil, students trace the outline of the leaf on the graph paper.

3. When they have finished tracing around the leaf, they count all the squares, including the squares which are only partly within the outline.

4. Teacher lists the number of units covered by the leaf on the board. Students discover how leaves from the same plant can be different.

Activity: Observation Bingo
Objective: 1,2
Materials: Bingo Cards (teacher-made); markers

Teaching Suggestions:

1. Construct Bingo Cards a little larger than usual. In the squares on the Card include items either pictures or words that can be seen on the school campus such as specific trees, ferns, grasses, types of bark, etc. Divide class into teams and give each a card. They find all the objects on the card, or make as many bingos as possible in a given time. Winners are first ones to fill their spaces on the cards with the correct objects.

Activity: Trash Collage
Objective: 2
Materials: Trash, art paper

Teaching Sussestions:

1. Have your class collect trash from the campus. Allow the students to select pieces of the collected trash and construct a collage.

Resources: Use Spoken Arts filmstrip and tape Dash McTrash and the Pollution Solution.

Activity: Sensitivity Walk
Objective: 2
Materials: Blindfold, children

Teaching Suggestions:

1. Divide group into two's. Blindfold one child and have the other child lead the blindfolded child by the hand on a round about walk to a particular place on the school-ground. Leave blindfolded child for a short time a this place. He gets clues by feel, sounds etc. The partner then leads blindfolded child by a round about route back to starting place. Remove blindfold. Child tries to find "his" place. Repeat with other partner.

Activity: Making Soil
Objective: 3
Materials: Soft stones

Teaching Suggestions:

1. Make some "Soil" by rubbing soft stones or bricks together. Compare the material with soil from a garden or park and discuss what changes take place as the rock particles be-comes soil.

2. Add some rotten sticks or composite material (decaying leaves or vegetable matter) to the rubbings of the stones & bricks. Discuss the changed appearance and texture. Emphasize the importance of adding the decomposing matter to provide nutrients to the soil.

Activity: Comparing Soil Samples
Objective: 3
Materials: Soil sample from a growing area & a barren area

Teaching Suggestions:

1. Dig up a small amount of soil from an area where things are growing and one from a barren area. What are the differences? Is there a way to make the barren area able to accomodate growing things? Some differences to look for: hardness, moisture, color, animal life.

Activity: Soil Erosion
Objective: 3
Materials: Sprinkling can; container of soil; sod; funnel; jar of water.

Teaching Suggestions:

1. With a sprinkling can, pour water over a one square meter container of soil with sod growing in it. Hold it so that any water will run into a funnel & jar. They will see that little soil is carried off by the water.

2. Next, do the same thing with soil without sod growing on it, & show them the soil in the water.

Activity: Comparing & Measuring Sediment
Objective: 3
Materials: Jars; water from river or stream

Teaching Suggestions:

1. Show a jar of water from a river, canal or lake that has been allowed to settle for 24 hours. Measure the amount of sediment on the bottom of the jar. Compare the results with a measurement of the sediment of a sample from the same river, canal, or lake taken immediately after a rainstorm.

2. Limestone in water- shake up & look at bottom

Activity: Happiness is a BEE!!
Objective: 4
Materials: crayons, paper and pencil.

Teaching Suggestions:

1. Draw a bee.

2. Give him a name.

3. Write about something good he has done or could do.

Activity: Plant Needs
Objective: 4
Materials: 5 x 5 cm. piece of black construction paper (2 for each group) - container of water

Teaching Suggestions:

1. Students measure a plant on the campus that is below their knees. Record the measurement in cm.

2. On one of the leaves of the plant they clip one of their squares underneath the leaf and the other on top of the leaf so no sunlight can hit the leaf.

3. After two days the student removes the paper from the leaf and compares the covered leaf to other leaves on the plant. They conclude that plants need sunlight to make their leaves green.

Activity: Campus Plant Book
Objective: 1,4
Materials: pencil, crayons, drawing paper.

1. Students make a drawing of their favorite plant on campus. Underneath their drawing, they write the things a plant needs to survive.

2. Drawings are compiled into a class book with the title "Campus Plant Book". The book may be placed in the classroom or the media center.

Activity: Setting up a Balanced Terrarium
Objective: 1,5,6
Materials: Rectangle aquaria with glass covers or wide-mouth gallon jars; sand; charcoal; good, dark soil; moss, ferns, pine seedlings taken directly from environment; small animals- earthworms, frogs, crickets, land snails; food for the small animals.

Teaching Suggestions:

1. Wash container well. Put a layer of sand about 1" thick on bottom of container. On top of sand, put a thin layer of charcoal from pet store (not the kind used for outdoor cooking). On top of charcoal, put in a layer of good dark soil.

2. Plant mosses, ferns, pine seedlings, any plants taken directly from the environment. Moisten spot where plant is to be placed, mositen roots of plant & then set in place. Keep in good indirect light. Keep terrarium cool. Water only when absolutely necessary, and then only sparingly. To have a balanced ecosystem, keep terrarium airtight. Moisture will condense on the top & will drip down as "rain".

3. Small animals may be included in the terrarium. Earth worms can be put in to aerate the soil. Frogs can be kept in a terrarium. Feed frogs raw hamburger, chopped fresh fish, insects, earthworms, grasshoppers, tiny strips of liver. Feed frogs once a week. They will not eat food unless it wiggles as though it were alive. (All food should be placed on a string or straw so that it will wiggle.)

4. Crickets can be kept in a terrarium. A bottle top makes a good drinking dish. A cricket likes fresh & decaying vegetable matter, dead insects, lettuce, soft fruit like bananas, & cheese.

5. Land snails will survive in a damp terrarium stocked with a few sticks, plants, & moss. Set a small piece of decaying wood in one corner for the snail to hide under. Feed

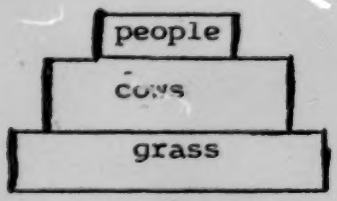
small fresh leaves of lettuce, other greens, & apples.

6. If earthworms are put in your terrarium, dampen a couple of leaves & lay them on top of the soil. Sprinkle tops of leaves with brown sugar & coffee grounds. The worms will soon make one or more burrows next to the glass, & you can see all that goes on. After a few weeks, you might return the worms & other animals to an outside garden.

Activity: Building a Simple Food Pyramid
Objective: 5
Materials: drawing paper, crayons

Teaching Suggestions:

1. Following a discussion of how people depend indirectly or directly on food from green plants for energy or growth, have students construct a simple pyramid. (See below) On the pyramid, trace different food chains & then let students illustrate it.

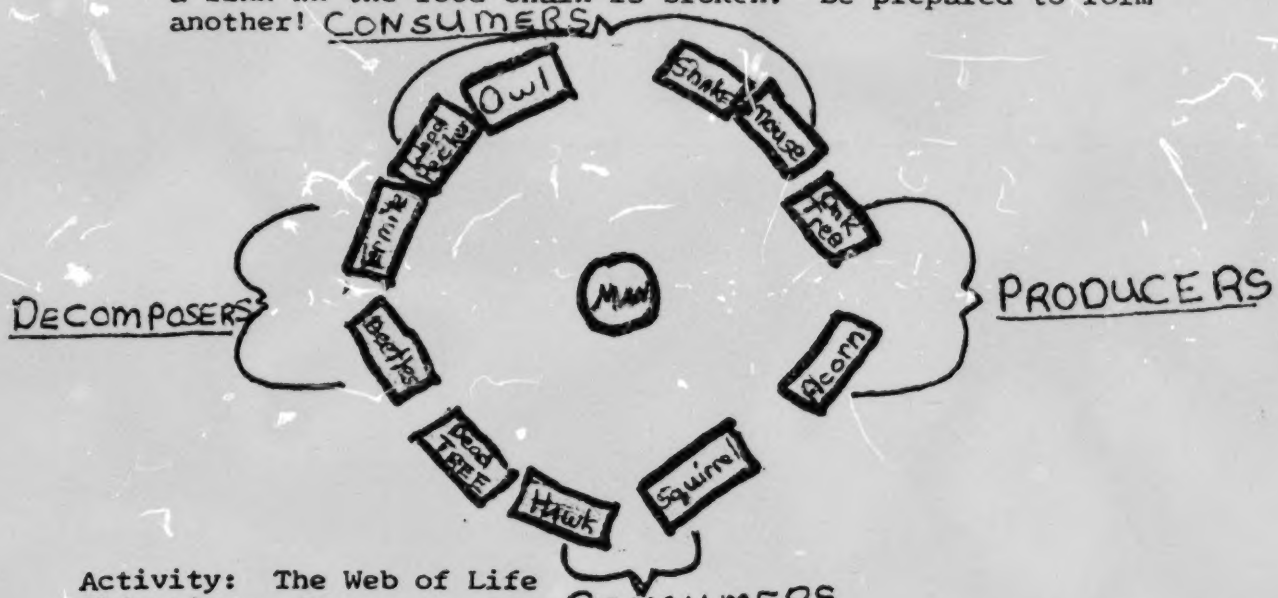


Activity: The Food Chain
Objective: 1, 5, 6
Materials: "Name" cards (4" x 12")
Purpose: To discover how plants and animals form a food chain of producers, consumers, and decomposers and what happens when the food chain is upset.

Teachings Suggestions:

1. Players form a circle as shown in the diagram below. Each player is given a "name" card identifying him as a certain kind of animal or plant. The leader stands in the middle with the name card "Man" and, starting with the plant, asks each player to hold hands with the player to his left. As each player holds hands, ask the group how these two "parts of the environment" are connected (or dependent upon each other). After all players are holding hands ask them to lean backwards as far as they can without falling over. Then without warning, the leader rushes through the group between two players, breaking their handhold. (be careful not to rush through too fast as you might break something else besides their handhold!) Once the handhold is broken, the group tumbles over backwards, showing how the entire food chain was unbalanced when one link was broken. Ask the group why this might happen in the environment when

a link in the food chain is broken. Be prepared to form another!



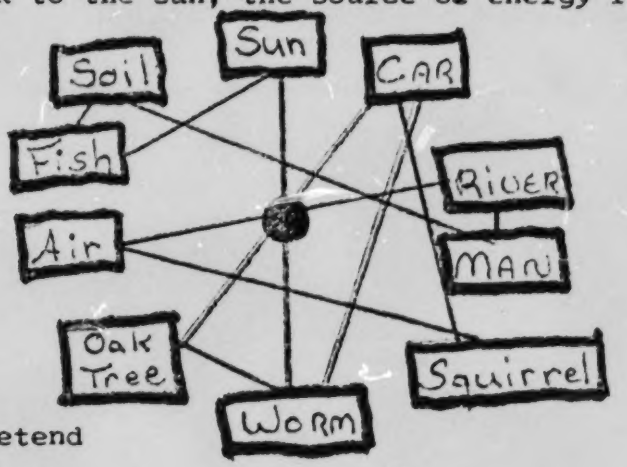
Activity: The Web of Life
Objective: 6
Material: Ball of string, "Name" cards (4" x 12"), Magic marker or crayon, Scissors

Purpose: To illustrate how plants and animals (including man) are dependent upon each other and upon the environment (sun, air, water and soil) for survival through a "web" of inter-relationships, and what happens if the web is damaged.

Teaching Suggestions:

1. Players form a circle. Each player is given a "name" card which identifies him as some part of the environment, such as the sun, air, water, soil, different types of plants and animals, and man, (and man made things such as cars, houses, factories, etc.). The leader begins by asking the "sun" to hold the end of a string and then unwinds the string from one player to the next, crisscrossing back and forth across the circle. As each player is connected, ask the group why a connection is important in the environment. For example, how is a tree "connected" to the sun (or dependent upon the sun), how is man connected to the tree, and so on. Any two players can be connected. Be sure to unwind the string in <u>one continuous strand</u>, don't cut it after connecting the players. Connect all players to at least one other player. After the connections have been made, the string will form a "web" which connects all major parts of the "environment", as shown in the diagram below. The leader then cuts the string between any two players and asks the group what will happen to the web of life now that a connection has been broken. Follow the cut string from one player to another, showing how one

broken strand can affect everything in the web since all are connected to one another. Eventually the connections lead back to the sun, the source of energy for all life.



Activity: Pretend
Objective: 6
Materials: none

Teaching Suggestions:

1. Pretend you're lost on an island.

2. What do you need to Survive? What do they come from? (animal or plant) Compare what you needed on the island with what you see at home. How much of what you have can you get along without.

Activity: Pattern and Color in Nature
Objective: 7
Materials: work sheet and pencil

Teaching Suggestions:

1. Ask the students why things have color. Do they think things have color for a reason? Why is chalk light? What color of ink shows up best on light paper? Tell students color also has pattern. What does red signal? (danger) What does color outdoors do for some insects?

2. Pass a work sheet to each student. Tell them you would like them to use color words to describe things they might find outdoors on their campus.

3. Students classify and list things by putting the word under the right heading in the second part of the work sheet.

Activity Sheet For Pattern and Color in Nature

1. Use color words to tell about the living and non-living things.

_____ ant _____ bird

_____ roof	_____ car
_____ bark	_____ rock
_____ leaf	_____ bike
_____ grass	_____ sidewalk
_____ sky	_____ fern
_____ twig	_____ flower
_____ sand	_____ berry

2. Which things are living? Which are not? Put the words from above in the right column.

Living Things	Non-Living Things
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.

ENVIRONMENTAL EDUCATIONAL EVALUATION FOR SECOND GRADE OBJECTIVES

1. Your environment is everything around you.

yes no

2. Plants and animals do not change

yes no

3. People can make their environment better.

yes no

4. If someone drops his papers on the walkway and leaves them, would you pick them up?

yes no

5. Soil can be moved by rain.

yes no

6. Soil is made only from rocks.

yes no

7. Plants will grow in the dark.

yes no

8. Some animals need protection from cold weather.

yes no

9. Only people are consumers.

yes no

10. People do not need green plants to grow.

yes no

11. People and animals only need water and air to live.

yes no

12. We must take good care of our water and air and soil to have a good environment.

yes no

13. Different kinds of plants and trees make our world beautiful.

yes no

14. We are using up our clean water and air.

yes no

15. As more people are born we will use more soil, water, plants, animals, water,and air.

yes no

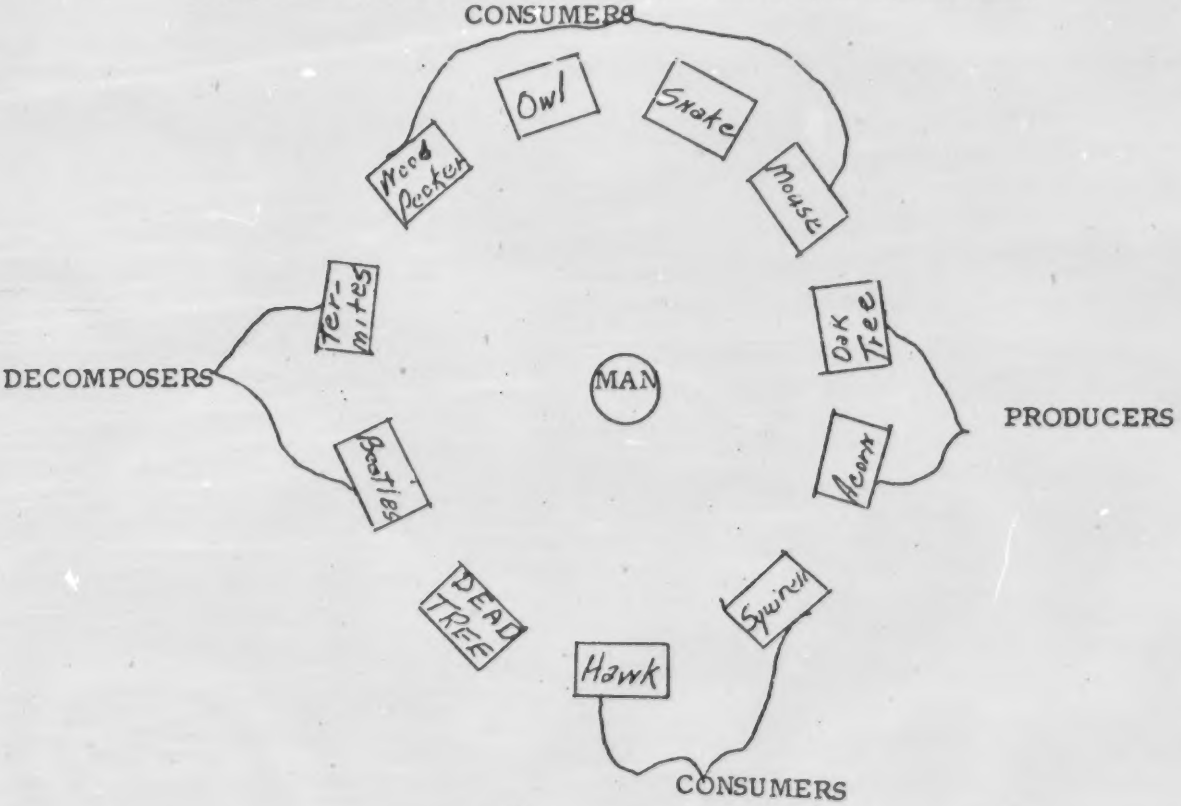
Grade: 2
Objective 1,5,6

THE FOOD CHAIN
(10-12 players)

Purpose: To discover how plants and animals form a food chain of producers, consumers, and decomposers and what happens when the food chain is upset.

Materials Needed: "Name" cards (4" x 12")

Description: Players form a circle as shown in the diagram below. Each player is given a "name" card identifying him as a certain kind of animal or plant. The leader stands in the middle with the name card "Man" and, starting with the plant, asks each player to hold hands with the player to his left. As each player holds hands, ask the group how these two "parts of the environment" are connected (or dependent upon each other). After all players are holding hands ask them to lean backwards as far as they can without falling over. Then without warning, the leader rushes through the group between two players, breaking their handhold. (be careful not to rush through too fast as you might break something else besides their handhold!) Once the handhold is broken, the group tumbles over backwards, showing how the entire food chain was unbalanced when one link was broken. Ask the group why this might happen in the environment when a link in the food chain is broken. Be prepared to form another food chain and break another link, and another.... and another!



Grade: 2
Objective: 6

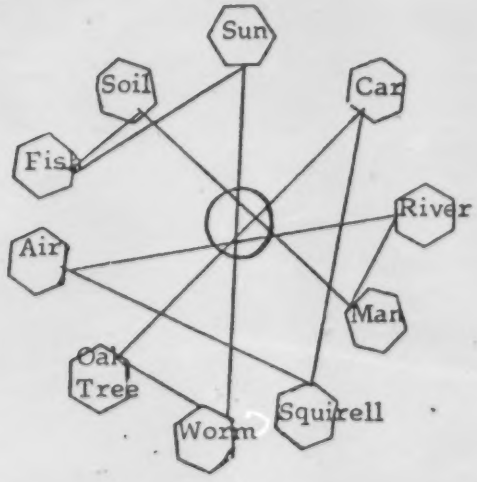
GAMES AND ACTIVITIES THAT ILLUSTRATE CONCEPTS OF ECOLOGY.....

THE WEB OF LIFE
(7-15 players)

Purpose: To illustrate how plants and animals (including man) are dependent upon each other and upon the environment (sun, air, water and soil) for survival through a "web" of inter-relationships, and what happens if the web is damaged.

Materials Needed:
- Ball of string
- "Name" cards (4" x 12")
- Magic marker or crayon
- Scissors

Description: Players form a circle. Each player is given a "name" card which identifies him as some part of the environment, such as the sun, air, water, soil, different types of plants and animals, and man, (and man made things such as cars, houses, factories, etc.). The leader begins by asking the "sun" to hold the end of a string and then unwinds the string from one player to the next, crisscrossing back and forth across the circle. As each player is connected, ask the group why a connection is important in the environment. For example, how is a tree "connected" to the sun (or dependent upon the sun), how is man connected to the tree, and so on. Any two players can be connected. Be sure to unwind the string in one continuous strand, don't cut it after connecting the players. Connect all players to at least one other player. After the connections have been made, the string will form a "web" which connects all major parts of the "environment", as shown in the diagram below. The leader then cuts the string between any two players and asks the group what will happen to the web of life now that a connection has been broken. Follow the cut string from one player to another, showing how one broken strand can affect everything in the web since all are connected to one another. Eventually the connections lead back to the sun, the source of energy for all life.



ENVIRONMENTAL EDUCATION EVALUATION FOR SECOND GRADE OBJECTIVES

1. Your environment is everything around you.

   ○ yes ○ no

2. Plants and animals do not change.

   ○ yes ○ no

3. People can make their environment better.

   ○ yes ○ no

4. If someone drops his papers on the walkway and leaves them, would you pick them up?

   ○ yes ○ no

5. Soil can be moved by rain.

   ○ yes ○ no

6. Soil is made only from rocks.

   ○ yes ○ no

7. Plants will grow in the dark.

   ○ yes ○ no

8. Some animals need protection from cold weather.

   ○ yes ○ no

9. Only people are consumers.

   ○ yes ○ no

10. People do not need green plants to grow.

    ○ yes ○ no

11. People and animals only need water and air to live.

    ○ yes ○ no

12. We must take good care of our water and air and soil to have a good environment.

    ○ yes ○ no

13. Different kinds of plants and trees make our world beautiful.

    ○ yes ○ no

14. We are using up our clean water and air.

○ yes ○ no

15. As more people are born we will use more soil, water, plants, animals, water and air.

○ yes ○ no

SEQUENCE

Third Grade

Objectives:

1. To understand how one natural environment differs from another natural environment.
2. To learn how living things adapt to different environments.
3. To understand how available natural resources influence the way people live.
4. To understand how people change the environment as they use natural resources.
5. To learn about different conservation practices and to understand the need for them in taking care of natural resources.
6. To continue to develop awareness of how the natural enviroment serves as inspiration for the creative arts.

Activity: Plant and Animal Survival
Objective: 1
Materials: A plant and an animal

Teaching Suggestions:

1. The students will select a plant and an animal found on the school campus. Then they will will go to the library and make reports on how the environment meets the needs of these plants and animals they have found.

2. The teacher will lead a discussion by asking the students what is an environment? What are some of the things that limit plant and animal life where you live?

Activity: Comparing Water
Objective: 2
Materials: Jars, Water from each environment.

Teaching Suggestions:

1. The teacher will lead a discussion about our natural environment and compare plant and animal life with that on the campus and the wooded area.

2. The students will compare the water running off a bare slope with water flowing from a grass-covered slope during a gentle rain. They will collect a jar of water from both areas and compare the amount of sediment in each.

Activity: Mural
Objective: 2
Materials: Long sheet of paper for the mural; crayons, scissors, glue.

Procudure: The teacher will lead the discussion with students about how living things adapt to different environments by asking questions. The teacher will write some of the adaptations of plants and animals on the chalk board.

Teaching Suggestions:

1. One student may draw the school on a large sheet of paper. Some of the other students will draw in the grass, sky, trees, waters and flowers that they see on the school campus. After they color what they made they may cut out animals and paste them in the area where they think they should go to complete the mural.

Activity: How Every Animal is Adapted
Objective: 2
Materials: Newspaper, paste, glue etc.
Procedure: The teacher leads a disucssion with students about animals adaptation for their environment in a specific environment and that this will determine its characteristics.

Teaching Suggestions:

1. Students create a unique animal giving it features that are campatible with its environment. Have the students put their creatures in the classroom situation and consider these suggestions: (1) How the Animal would behave in the cafeteria. (2) How the Animal would behave in the bathroom; What he should be doing while waiting for the bus etc.

Activity: Plant a Garden
Objective: 3, To understand how available natural resources influences the way people live.
Procedure: The teacher leads discussion by asking questions about our natural resources. After the discussion plan a site on the campus for a garden.

Teaching Suggestions:

1. Start a school garden with different kinds of Plants. Learn how to manage soil and water resources to encourage the growth of these plants.

Activity: A Play
Objective: 2
Materials: Signs-poster paper, construction paper, scissors, paste, costumes- crepe paper, tape.
Procedure: The teacher will discuss with the students about our natural resources and how it influences the way people live that man has made many of the world's renewable resources finite by his mismanagement of these. Then the students will produce a play.

Teaching Suggestions:

1. Students will present a play on how marine life requires oxygen. The actors will each take the part of a marine creature such as a fish, starfish, a hermit crab, a scallop, a sea horse, etc. The creatures will have costumes and signs to help relate the idea that the everincreasing polluti on in our environment is affecting our air cycle.

Activity: Nature Art
Objective: 4, To understand how people change the environment as they use natural resources.
Materials: Piece of light cardboard for each child, glue

Teaching Suggestions:

1. Students collect materials from campus to show how change takes place. Show change in color, shape, fresh to dried materials. Students glue materials on to cardboard to show the change. Display work on bulletin board.

Activity: What and How
Objective: none
Materials: Pencil, paper
Procedure: Teacher leads discussion by asking the students if they have changed. In what ways have they changed? Are some changes taking place that they can do nothing about? What are some? Can they do things to change themselves? All living things change: Ask students to look around themselves to see how plants and animals change.

Teaching Suggestions:

1. Students prepare their paper by making two columns.

2. One column is labeled "What is Changing?", and the other, "How is it Changing?".

3. Students find evidence of change on the campus. (He) (She) lists the thing changing and tells how it is changing.

Activity: Listing Products
Objective: 5, To learn about different conservation practices and to understand the need for them in taking care of natural resources.
Materials: paper, pencil

Teaching Suggestions:

1. List the products made from natural resources in your community and used in other places.

Activity: Beautifying the School Campus. Make a study of the school grounds and plan a conservation project to improve the environment for plants, animals, and people.
Objective: 2
Materials: pencil, paper etc.
Procedure: For each activities, the teacher will lead a discussion by asking questions: example- What are some conservation practices used by builders and farmers in your community to protect the soil.

ENVIRONMENTAL EDUCATION EVALUATION OF THIRD GRADE OBJECTIVES

Directions: Read each question carefully. Mark your answer (A,B, or C) on your answer sheet.

1. If you went into a woods, would you pick a lot of plants to take home?
   A. Yes B. Not Sure C. No

2. If you saw a friend destroying a lot of plants would you ask him to let the plants grow?
   A. Yes B. Not Sure C. No

3. If you were in the woods could you be careful not to destroy animals' homes?
   A. Yes B. Not Sure C. No

4. Do you think we can learn more by using our senses more often?
   A. Yes B. Not Sure C. No

5. Do you throw trash on the ground at your school?
   A. Yes B. Not Sure C. No

6. Do you throw trash on the ground at you home?
   A. Yes B. Not Sure C. No

7. Do you throw trash on the ground in the woods?
   A. Yes B. Not Sure C. No

8. If your class decided to start a project would you like it to be one that might help your environment?
   A. Yes B. Not Sure C. No

9. Do you think you can help save our environment?
   A. Yes B. Not Sure C. No

10. If you and your family saw a person killing an alligator would you ask your parents to report this to the authorities?
    A. Yes B. Not Sure C. No

11. Would you be willing to tell a friend to stop littering?
    A. Yes B. Not Sure C. No

12. Would you be willing to sort your family's trash into paper, metal, glass, etc. for recycling purposes?
    A. Yes B. Not Sure C. No

13. Would you be willing to stay on paths and sidewalks to avoid walking on plants?
    A. Yes B. Not Sure C. No

14. Do you ever watch T.V. specials dealing with environmental problems?
A. Yes B. Not Sure C. No

15. Man should get rid of all pests that bother him.
A. Yes B. Not Sure C. No

16. Man should kill all the snakes he sees.
A. Yes B. Not Sure C. No

SEQUENCE

Fourth Grade

Objectives:

1. To understand the cycles within the natural environment.

2. To learn more about the ways resources are changed through use.

3. To understand how people in different environments manage water resources.

4. To understand some of the choices man must make in applying conservation practices.

5. To learn how natural resources contribute to the production of materials used in the creative arts.

Activity: Evaporation Rates
Objective: 1
Materials: shallow pans, water

Teaching Suggestions:

1. Place shallow pans of water at different places on campus. Measure anmount of water carefully. Allow pans to sit for 1 to 4 hours. Why did water evaporate faster in some areas that in others? Was the wind the same at each spot? Was the amount of sunlight the same?

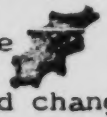
References- On Campus Teaching-Activity Guide, Lee Co. Schools.

Activities: Water Cycle
Objective: 1
Materials: The Story of a Raindrop, paper & crayons (See attached sheet)

Teaching Suggestions:

1. Read story aloud. Have students write story using words in place of pictures. (Language arts activity) Draw mural of water cycle.

The Story of a Raindrop

One day a little fell on a . The warmed the  and the little disappeared. The little had changed in vapor. It was now hidden in the air. But the air was cold and changed the vapor back in a . It joined other little and formed a Soon the came heavy with many . The little came back to the . Where do th the little landed this ?

Activity: Food Chains
Objective: 1
Materials: dittoes of chains with missing parts (see attached sheet)

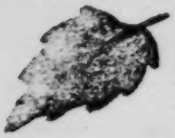
Teaching Suggestions:

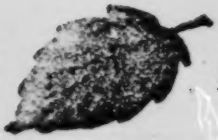
1. Students fill in missing pictures to complete chains. Find magazines pictures to make a bulletin board.

Producers- green plants
Consumers- food eaters

Play — Little Johnny Raindrop

The Story of a Raindrop

One day a little fell on a  . The

warmed the  and the little disappeared.

The little had changed in 2 vapor. It was now

hidden in the air. But the air was cold and changed the vapor

back in 2 a . It joined other little

and formed a . Soon the

came heavy with many .

The little came back to the .

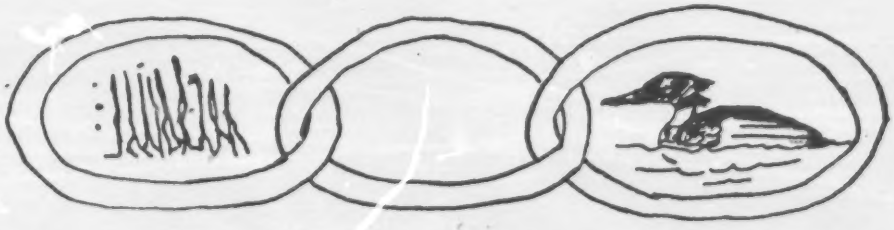
Where do U th the little

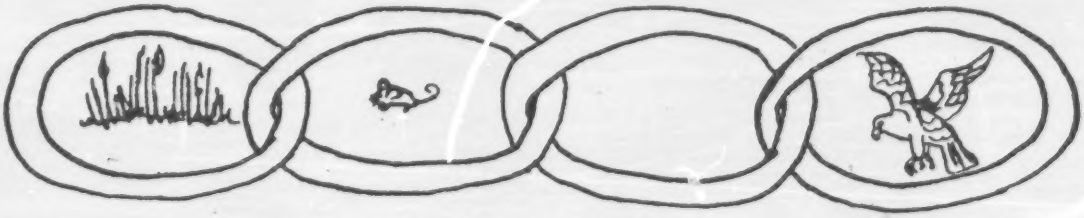
landed this ?

Plants get their energy from sunlight. Plants are a little like factories. They use water and minerals and air and make their own food. The green coloring in their leaves (called chlorophyl) turns these things into a kind of sugar. The plant uses some of this sugar to live and grow, to make flowers and seeds and new leaves. When a cow eats the plant, it gets the extra sugar stored in the leaves of the plant.

All green plants make food for themselves, but animals eat them as food also. Many animals are food for other animals, too. The picture below shows a FOOD CHAIN.

TRY THIS! Put in the missing parts of these food chains.





Because plants are part of all food chains, every living thing depends on the sunlight water air soil which plants need to grow.

Activity: Food Chains (cont.)

Decomposers- recycled back into nutriuts to be used again

Man is an consumer

water
feed
sunlight
plant feet in soil

Are you producing food?

Activities: What Makes A Fire Burn
Objective: 2, To demonstrate how and why a fire burns.
Materials Needed: One box of Kitchen matches, two quart jars and lids, One can with a tight lid (coffee can), Wire screen 4" x 4", Two large candles,and four or five birthday candles, Some fireproof material or box of dirt (about 2' x 2').

Teaching Suggestions:

Fire can be a helpful friend or a dangerous enemy. It can be handled safely and used for our comfort during outdoor activities when we employ carefully and understand the principles of combustion. Heat, air, and fuel are necessary to produce fire.

1. The need for heat can be demonstrated in two ways:
   a. Place a deheaded match on the wire screen. Support the screen about ½" above a burning candle. The match will catch fire and burn.
   b. Place a few cedar shavings in the coffee can. Punch a nail hole in the top. Heat the can until the gases coming through the hole will burn. Then examine the shavings in the can.

2. Air is essential to combustion. This fact can be demonstrated as follows:
   a. Place a candle in a quart jar. Light, then tighten the lid.
   b. Build a small fire with matches, then cover with a jar.
   c. Light another small fire and cover with sand.

3. Any fire must have fuel in order to burn. Try these demonstrations to illustrate the third requirement for fire:
   a. Build a fire of small sticks. Begin to take away sticks and observe how five dies. If fuel is allowed to remain, the fire spreads.

b. Light a candle stub. As the small amount of wax burns, the fire will go out.

A fire robbed of its heat, air, or fuel will go out. Safe fire handling calls for an understanding of knowing how and why fires burn.

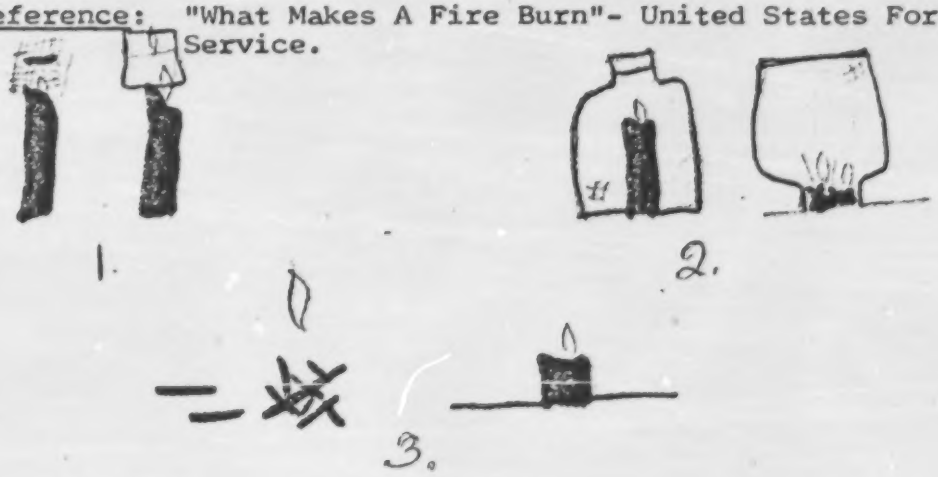
Questions:

1. What are the three items necessary for fire?

2. What happens when water is poured on a fire? (cooling)

3. What happens when sand or dirt is placed on a fire? (robbed of air)

Reference: "What Makes A Fire Burn"- United States Forest Service.



Activities: Resources are changed Thru Use
Objective: 2
Materials: 6 glasses of water, salt, fertilizer, oil, detergent, & soil

Teaching Suggestions:

Put soil, etc. in water. (Shake)

1. Does it go to the bottom, top or does it mix?

2. Which smell alike? Look alike?

3. How can we clean the water so we can drink it? (filter)

4. How can we conserve water? (mulch). Visit water treatment plant.

References- Resource person from Water Treatment Plant
Film: The Eternal Forest
Div. of Forestry
Forest Education Bureau
Collins Bldg. Tallahassee, Fla. 32304

Activities: Studying Management of Water Resources
Objective: 3
Materials: The Wonder of Water comic books and teacher's guide available from Santa Fe Soil Conservation.

Teaching Suggestions:

1. Read books & follow suggestions in teacher's guide.

Activities: Water Resources
Objective: 3
Materials: juice cans

Teaching Suggestions:

1. Attach rulers to inside of juice cans. Have students place cans in various places on campus during a rain. Are there areas that receive more water than other areas? Is the vegetation different in these areas? What effect does standing water have on the soil, vegetation, insects, etc? Is improper drainage harming soil, buildings, or sidewalks? Where does water falling on buildings, parking lots, streets, tennis courts, etc. go?

Activities: Has Man Been Here?
Objectives: 4
Materials: paper & pencil

Teaching Suggestions:

1. Assign small groups of students to a defined area of the campus. Students will record as many evidences as they can find that their area has been visited by man. Discuss good & bad effects of humans on the environment. Debate for ranging effects. See if they can predict future effects. (Survey where highway will abut schoolyard) Record changes as road building progresses.

Activities: Nature Riddle Writing
Objective: 4
Materials: pencils, paper

Teaching Suggestions:

1. Take students on a tour of the campus or other area. Find natural objects that have been changed by man. Changes may be good or bad. Back in the classroom, write riddles of items seen on schoolground. Let others try or guess answers. Example: (1)Broad, even, well-trimmed & green. I serve you better when you keep me clean. (grass) (2) I go up, then I (come down) am used by man all over town; fun to play in, good for the crops, but when you pollute me, I can't call the cops. What am I? (water)

Activities: Scavenger Hunt
Objective: 5
Materials: none

Teaching Suggestions:

1. For awakening one's awareness to detail around him, divide into groups; each group with a different list. Allow about 20 min. Share objects they have found.

Example:

1. three simple shapes
2. a sweet taste & a sour taste
3. A pleasant & an unpleasant smell in nature
4. trace from an animal
5. three different textures
6. o n e sound from nature
7. something older than you & something younger
8. 3 different colors

Activities: Construct objects from objects in nature
Objective: 5
Materials: Drawing paper, leaves, berries, burned woods, etc. to be gathered from the school grounds

Teaching Suggestions:

1. After instructions on procedure, take children on a walk to gather materials. Draw pictures with materials gathered.

Activities: Nature Bingo
Objective: 5
Materials: Bingo game for each child (see attached copy)

Teaching Suggestions:

1. Give each child a copy of the bingo card and allow them time to look for materials. See who can get "Bingo" first.

Rough Bark	Thorn	Litter	Seed Without Stickers
Fuzzy Leaf	Smooth Edged Leaf	Black Dirt	More than Three Inches Wide Leaf
Seed With Stickers	Leaf That Is Not Green	Acorn	Heart Shaped Leaf
Small Rock	Leaf Less Than One Inch Wide	Leaf With Saw Toothed Edge	Smooth Bark

P 17

NATURE BINGO

ROUGH BARK	THORN	LITTER	SEED WITHOUT STICKERS
FUZZY LEAF	SMOOTH EDGED LEAF	BLACK DIRT	MORE THAN THREE INCHES WIDE LEAF
SEED WITH STICKERS	LEAF THAT IS NOT GREEN	ACORN	HEART SHAPED LEAF
SMALL ROCK	LEAF LESS THAN ONE INCH WIDE	LEAF WITH SAW TOOTHED EDGE	SMOOTH BARK

SCAVENGER HUNT

1. Beauty berry
2. Wild grape leaf
3. Acorn
4. Pine cone
5. Virginia creeper leaf
6. Oak leaf
7. White stone
8. Grass seeds
9. Seeds with stickers
10. Red leaf
11. Yellow leaf
12. Pine needle
13. Insect
14. Red clay

SCAVENGER HUNT

1. Beauty berry
2. Wild Grape leaf
3. Acorn
4. Pine cone
5. Virginia creeper leaf
6. Oak leaf
7. White stone
8. Grass Seeds
9. Seeds with stickers
10. Red leaf
11. Yellow leaf
12. Pine needle
13. Insect
14. Red clay

Activities: Art
Objective: 2&5
Materials: berries, water, cloth

Teaching Suggestions:

1. Collect berries. Use to dye cloth

Activities: Pottery
Objective: 5
Materials: clay

Teaching Suggestions:

1. Ask students to bring native clays to class to make pottery.

Activities: Field trip
Objective: 4

Teaching Suggestions:

1. Take children to Hunter's Creek in Hamilton Co. to see what pollution can do to water

Activities: Natural Resources
Objective: 2
Materials: Pictures of everyday objects such as bricks, paper, lunch trays, pencils, etc.

Teaching Suggestions:

1. Go outside and see if they can find the source of their objects. Bring out the idea of limited resources & wise use of natural resources.

Activity: Junk Band
Objective: 5
Materials: Objects such a Pringles Potatoe Chip cans, lids, bottle caps, etc.

Teaching Suggestions:

1. Take instruments and form a band.

ENVIRONMENTAL EDUCATION OF FOURTH GRADE OBJECTIVES

1. There will always be enough water, no matter how much we use.
   yes no

2. It is alright to throw trash in a dirty area.
   yes no

3. Do streams contribute to pollution?
   yes no

4. Noise is a kind of pollution.
   yes no

5. Water can be purified by flowing through sand or rocks.
   yes no

6. Water is always going up and down.
   yes no

7. It is everyone's responsibility to save energy.
   yes no

8. The sun is the source of all energy.
   yes no

9. Plants and animals need each other for air.
   yes no

10. Every environment has the same amount of water.
    yes no

11. Man always makes the environment better when he changes it.
    yes no

12. All food chains begin with plants.
    yes no

13. Evaporation is going on all around you.
    yes no

14. Warm air can hold more water than cold air.
    yes no

15. You should throw away your toys when you are too old for them.
    yes no

16. You use less water taking a shower than a bath.
    yes no

17. All living things depend upon water.
yes no

18. We will never have smog in Lake City because we don't have large factories.
yes no

19. Children have to make choices to make our environment better.
yes no

20. Man can change his environment for the better or worse.
yes no

SEQUENCE

Fifth Grade

Objectives:

1. To understand how decisions about use of resources and energy affect the natural environment.

2. To become aware of how the environment influences man's way of life.

3. To understand some of the effects of natural and man-made changes in the environment.

4. To understand how natural resources contribute to the development of a nation.

5. To understand how social and economic factors influence use and management of resources.

6. To learn how people plan and take action to conserve natural resources.

7. To continue to learn how natural resources contribute to the production of materials used in the creative arts.

Activities: Changes in our Soil can be the result of natural and human impacts
Objective: 1
Materials: Drawing materials; paint; butcher paper (optional).

Teaching Suggestions:

1. Have students find examples of soil erosion (actual or pictures) and draw pictures or mural in which they illustrate the causes of the erosion. Some research might be needed. (Forest fires, strip mining, road construction, and parking lots).

2. If the activity is extended into a class mural, some students should research the functions performed by watersheds (natural) and dams (man-made) in the prevention of soil erosion.

3. Materials: soil samples, wire baskets, wide mouth jars, and water. Compare soil samples - from a cultivated field and an undisturbed fence row- for their ability to soak up water. Use samples about twice the size of an egg and lower them into the jars of water in the wire baskets.

4. Materials: Pencil and paper. Have students submit plans and ideas for preventing soil erosion. (Cover crops, mulch, contouring, and land scaping).

5. Materials: Soil samples, pans, white glue, sieve, stiff white paper, and oven. Collect colored soils-dry in a slightly opened oven (about 1-2 hours @ 150°), sift debris. Using glue, design patterns on the paper while the glue is wet, sprinkle each color to build a sand painting.

Soil Survey

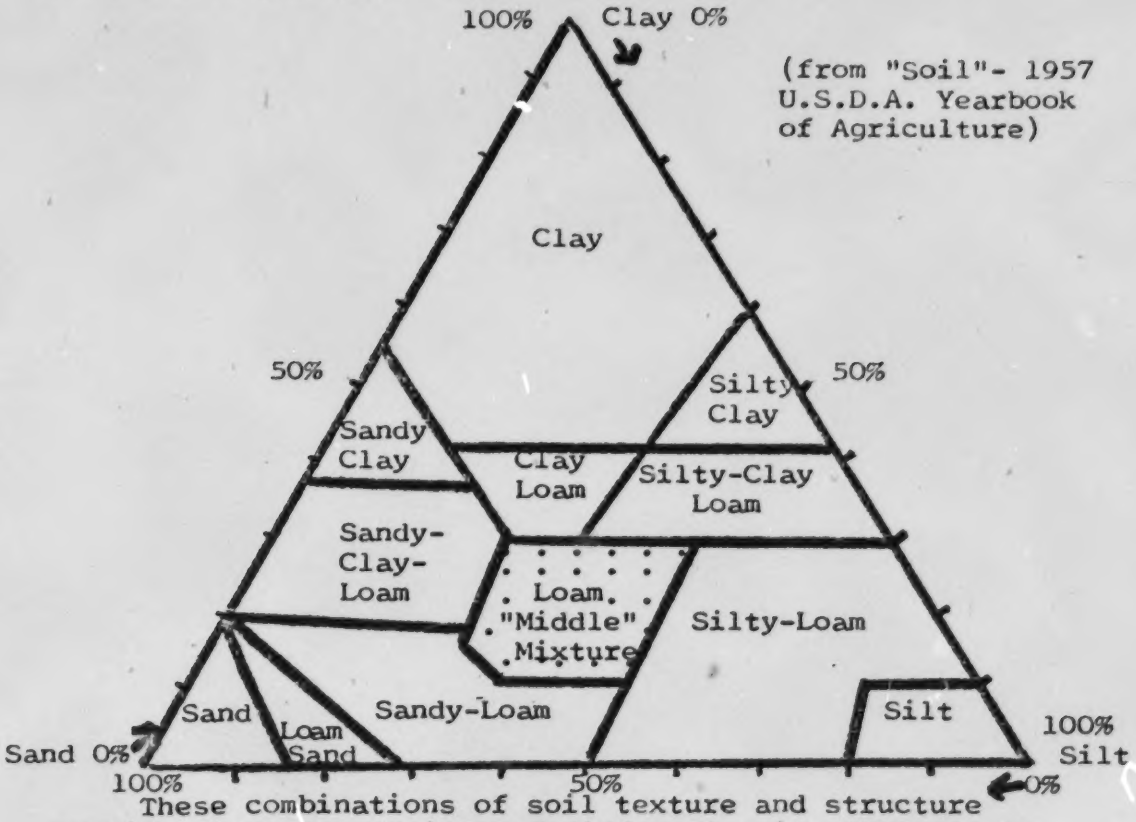
Texture:

Soil texture can be described as the "gritty" feel the size of the mineral particles determine whether a soil is a sand. . . with particles in the 0.05 to 2 millimeter range, a silt. . . with a particle range of 0.002 to 0.05 mm or a clay. . . with a particle range of less than 0.002 millimeters. Texture provides the first breakdown in classifying, or grouping, soils. The soil is simply sifted through a series of screens and percentages of each size range recorded.

Structure:

Soil structure is the proportional mix of the dif-

ferent soil particle sizes.



These combinations of soil texture and structure provide the great variety of different soils that can be described their physical character. These characters also describe the capacities of the soils to retain available nutrient supplies and moisture for associated plants.

pH:

Acidity or alkalinity in a soil is due to a complicated reaction based on the reactions of water upon the soluble mineral components (eg. calcium, phosphorous, potassium, iron and others); the organic component.; and other reactions involving dissolved carbon dioxide and nitrogen oxides from the atmosphere. The end result is measured by the amount of hydrogen or hydroxyl ions in a soil. . .pH.

Plants have a great interest in acid or alkaline soil conditions, as the proper pH allows root systems to transport vital nutrient ions across cell membranes. (A touch of biochemistry is in order to remember that a plant photosynthesizes carbon-dioxide and water into simple sugars, and the photosynthetic particles of chlorophyll need nutrient ions --- particularly of iron and phosphorous -- in order to function at a Thus every plant species dependent upon soil for nutrients a range of acidity/alkalinity within which it can thrive outside that range, the species will not grow well from inavailability of nutrients.

Often a soil gives its character away with little need for a complex analysis. Pines grow best on an acid soil, broad-leaf trees on an immediate and slightly acid soil, grasses do their best on "sweet" or alkaline soils.

The color of the soil at different depths indicates mineral components. Light greys show aluminum and silicates, reds show iron oxides, dark pigments show organic substances breaking down into free carbon and blues often show certain clays. Color is also important to the heat absorption character of the soil. . . dark colors get hotter than light-colored soils.

The smell of a soil indicates the quality of the humus or organic matter component, as well as accompanying chemical activity. . . a sour odor indicates an acid or fermenting process, a sweet odor indicates an alkaline process.

Soil is not only dependent on its chemical and physical make-up, but also how it lays on the face of the earth. The incline or slope of the land can allow water erosion to "move" soils from high to low areas, creating sandy ridges and dark, mucky bottom lands. An immense amount of once fertile soil isn't on the land at all. . . but under the sea at broad river deltas because of seasonal flooding of soft sedimentary plains.

Activities: Essential requirements for life
Objective: 2
Materials: Pencil and paper

Teaching Suggestions:

1. Discuss the words, interdependence and relationship; then send the class outside to make a list of all the interesting things they can find on the school ground that fit the categories.
When they return to the classroom, the names of the objects they have observed are written on the blackboard, then lines are drawn connecting things that the children feel are related. The pattern resembles a web-the web of life-"ecology."

2. Have students determine the major producers and consumers on their campus. From this information, they should construct a simple campus food web. What could be done to insure the complexity of the food web and thereby increase its stability? Let the students plan a way to carry this out.

3. Review the three Basic Life Requirements of plants: Sunlight (food), Water, and Oxygen for roots. Have students take a survey of the areas on the school grounds where the plants do not grow. Determine which of the major life requirements for plants is

missing. (Bare ground on paths or playground sites can be related to soil compaction, which reduces the necessary amounts of oxygen in the soil. Stress the importance of burrowing organisms and plant roots to loosen and aerate such soils.)

4. Attempt to locate some living thing which is dependent upon some non-living thing. Next, find an example of non-living thing which is injurious to a living thing.

5. Find a group of something that appears to be working together for their mutaul good, while a single one might not be able to survive by itself.

6. The air gets its warmth from the earth which absorbs heat energy from the sun, and this heat radiates into the air. Hang four thermometers on the shady side of a post, one close to the ground, and the others at different heights above the ground. Record the readings several times during the day. Which thermometer shows the highest temperature? How can this be explained? Would there be similar differences in temperature readings at night several hours after the sun has gone down? How do you know you are taking the temperature of the air and not that of the post? If the thermometers were placed near the ground and above it on the sunny side of the post, what would be the results? How is this knowledge useful to people?

7. Water is one of our most valuable resources. List the ways that lakes, rivers, and oceans are used for recreational activities.

   Have class list all the ways they use water in their homes in one day. Estimate the number of gallons a family uses in one day. Estimate the number of gallons a family uses in one month. Determine the daily supply needed in the community

   Construct a simple water filter using a coffee can. See-"A guide. . . Science in Florida Elementary Schools" page 144. Pour some very muddy water into the filter. Compare the filtered water with the muddy water.

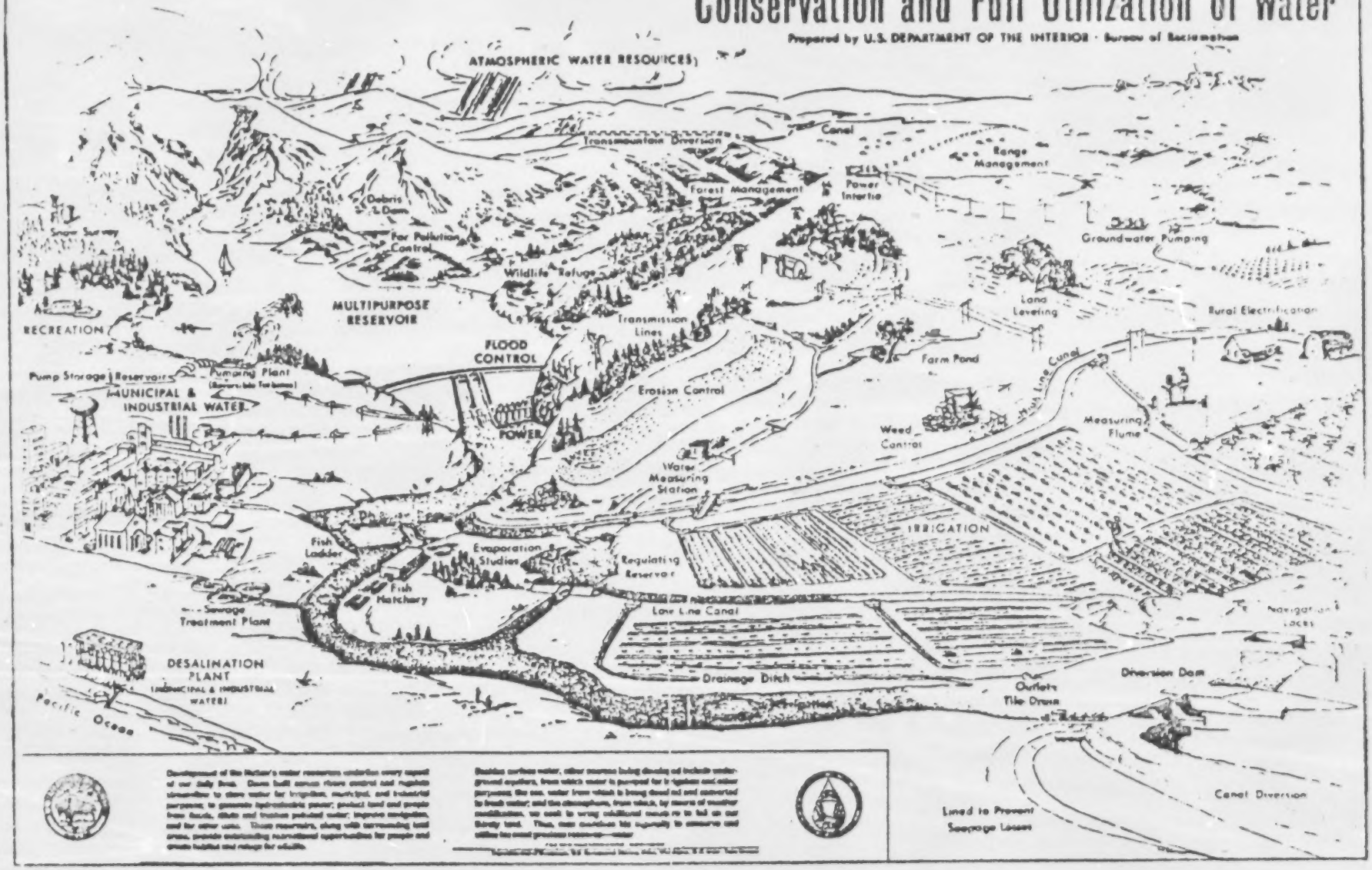
   Compare the effects of freshwater & salt water on plants.

   Discuss the effects of running water on open field, streams, and rivers. (Soil erosion, wearing away of banks, and rocks). Discuss Septic tanks sewage systems.

   Show how different substances dissolve in water-sugar, salt, and borax. Saturate a glass of water with salt and then let the water evaporate and check the results.

Conservation and Full Utilization of Water

Prepared by U.S. DEPARTMENT OF THE INTERIOR · Bureau of Reclamation



Development of the Nation's water resources underlies every aspect of our daily lives. Dams built across rivers control and regulate streamflow to store water for irrigation, municipal, and industrial purposes, to generate hydroelectric power; protect land and people from floods; dilute and transport polluted water; improve navigation; and for other uses. These reservoirs, along with surrounding land areas, provide outstanding recreational opportunities for people and create habitat and refuge for wildlife.

Besides surface water, other resources being drawn on include underground aquifers, from which water is pumped for irrigation and other purposes; the sea, water from which is being desalted and converted to fresh water; and the atmosphere, from which, by means of weather modification, we could in some undiscovered manner be led on our thirsty land. Thus, more overdraws his capacity to conserve and utilize his water previous resources—water

Sloan

Activities: Food Chain Problem
Objective: 3

Materials: pencil and paper
Problem:

1. A small island in a warm climate once had a large population of lizards. Other animals found on the island were rats, owls, and hawks. Then man brought goats to the island because there seemed to be a need for them. Soon the people on the island noticed that the nunber of lizards on the island decreased greatly. Goats, however, do not eat lizards nor do they eat any of the lizards' food. The islanders are not able to solve this mystery. They ask you to help them.

2. You know that the natural food chain was as follows: hawks eat owls; owls eat rats; rats eat lizards. You also know that goats eat owls. From what you understand about the animals' eating habits, try to find out what happened to the lizards. (KAIBAB FOREST EXPERIENCE.

NOTE to Teacher: Accept any reasonable explanation which deals with a change in the food chain. For example, following are two logical explanations:

(1) Since both hawks and goats are now eating owls, the owl population has dropped so low that not enough rats are being eaten. More rats are therefore feeding on lizards and the lizard population is dropping fast.

(2) Hawks cannot compete with goats in capturing owls. The hawks therefore have turned to the lizards as another source of food. Since the hawks and rats are now both depending on the lizard for food, more lizards are being eaten than can be replaced by reproduction.

Additional Research:

a. Let students voluntarily find out what happened in Australia when one Australian farmer imported a few rabbits just for the sport of hunting rabbits. Find out how the rabbits upset the natural balance in Australia's food chain.

b. The affect of the Water Hyacynth in Florida.

c. The fuel shortage and world economics.

Activities: How Natural Resources Contribute to the Development of a Nation
Objective: 4
Materials: pencil and paper, encyclopedias, and Social Studies Reference books

Teaching Suggestions:

1. List the available resources of the United States and any other nation you wish to compare it with. Try to pick on underdeveloped or non-industrialized nations. Compare U.S. in earlier time.

2. Compare the life styles and economic status of the two countries.

3. Compare their governments and religious affiliations.

4. Compare the population density and the life expectancy of peoples of both countries.

HOW can we use this info in planning how our resources can be used in the best interest for the future-"Land use planning on Local Level" - Inventory local resources.

Activities: Social and Economic Factors Influence the Use and Management of Resources
Objective: 5
Materials: Pencil and Paper, Encyclopedias, and Social Studies Reference Books

Statements:

(1) The United States, with 6% of the world's population uses 35% of the world's energy, and our demand is doubling.

(2) The United States may run out of low and moderate cost natural gas, oil, and uranium in less than 30 years.

(3) All types of energy will cost more in the future because they are becoming scarce and because in the past environmental and social costs were largely ignored.

Teaching Suggestions:

1. Have the students list the natural resources that are part of their every day living.

2. Have the students list some of the ways that they can personally help to reduce the consumption of natural resources at home and at school.

3. How does our way of life influence our use and management of our available resources?

4. What are some of the changes that we are going to have to make in our present way of living in order to conserve energy and our natural resources.

5. Ask students to explain why people do not wish to do without those convenience items that consume electricity.

6. Have the students list five products made from crude oil and indicate how they are used.

7. Have the students contrast renewable and non-renewable resources, including, but not limited to fuel, minerals, and other energy sources.

8. Have the class research the life styles of the Australian Aborigines, the Eskimos, and the Kalahari Desert tribes. What are their resources? What implications are there for us if we are faced with severely restricted resources? How would we modify our life styles? Ask for justification of explantions.

Activities: Wise Use of Natural Resources: A Tree and Its Family
Objective: 6
Materials: Paper and Pencil; Hand lens; Worksheet

Teaching Suggestions:

1. Class should be divided into small groups to encourage quietness during this activity.

2. Small groups should visit a tree or an area of shrubs on the school ground. During the allotted time the observers are to record all signs of life which they are able to observe by sight and sound. Hand lens may be used to examine under small sections of removed bark or in soil protected by tree's shade. If students are unable to name all the insects and birds properly, have them give generic terms only.

3. Back in the class room explain that trees are one of our natural resources. Then encourage the students, based on their recorded data, to discuss the immediate and long range effects resulting from the removal of the tree or shrub involved in their observations. Try to lead the discussion to the point where our unwise use of forests eventually makes us the losers; for example, if we destroy the tree, we inevitably destroy many living things that depend directly on that tree. How many living things depend on those destroyed when the tree is removed?

4. At the teacher's option and depending on student interest, students may develop a graphic idea of a tree's ecosystem, or "family". Some research may

be suggested into photosynthesis, a tree's role in a watershed, or in cooling the air.

5. Why are trees considered to be a renewable resource? What are we doing in our world today to conserve this valuable resource?

6. Have each student make a list of the important species of trees of the world that have commercial value and what type of environment is required for their best growth.

7. Using a map have each student locate the important forest areas of the world.

PRE-TEST

I. Matching

_____	energy	1. energy form that is freed by changes in the center of an atom
_____	pollute	2. from the sun
_____	efficient	3. working well; without waste
_____	fossil fuels	4. to use again and again
_____	geothermal	5. the ability to do work
_____	nuclear	6. not able to be replaces; being used at a faster rate than it can be formed
_____	nonrenewable	7. to make dirty or unclean
_____	recycle	8. to save from harm, loss, or waste
_____	solar	9. fuel formed by decaying ancient plant and animal life
_____	conserve	10. power source found in areas of the earth having hot springs and geysers

II. List the names of three fossil fuels.

a. _____

b. _____

c. _____

III. List three possible new energy sources which may be used in the future.

a. _____

b. _____

c. _____

4.6.1 Pre-test (continued)

IV. List or draw pictures of four (4) energy saving actions: two (2) which you are <u>now</u> practicing at home and two (2) practiced by you and your family in the area of transportation (getting from one place to another).

Home	Transportation
a. _____	a. _____
_____	_____
_____	_____
_____	_____
b. _____	b. _____
_____	_____
_____	_____
_____	_____

"ENERGY" WORDS

1. aluminum: a silvery metal which may be recycled for use
2. appliance: a machine which does a special job
3. atomic: having to do with atoms
4. conserve: to keep from being hurt, lost, or wasted
5. consume: to use up
6. conversion: a change from one thing to another
7. ecology: the study of the interrelationships of living things to one another and to their environment
8. efficient: working well, without waste
9. electricity: a secondary source of energy which we usually generate by burning fossil fuels and by harnessing falling water
10. energy: the power to do work or be active
11. environment: the things that surround you
12. fission: the splitting apart of atoms to release energy
13. food: the fuel used by man
14. fossil fuels: fuels such as coal, oil, and natural gas which are formed by rotted or decayed plants and animals that lived long ago
15. fuel: something that is burned to give heat or power
16. fusion: the joining together of atoms to produce energy
17. gasoline: a liquid fuel used in cars for power
18. geothermal: energy, in the form of heat, within the earth which can be tapped to make steam
19. generate: to make or produce

20. geyser: a spring in the ground from which hot water and steam shoots into the air
21. harms: hurts or causes damage
22. harness: to control so as to use the power of
23. heat: a form of energy which can be used to do work
24. hydroelectric: electric power made from the force of falling water
25. industry: a large business
26. kilowatt: a measure of electrical power, equal to 1,000 watts
27. machine: a device which does work
28. natural gas: an energy source in the form of a gas (not liquid or solid) found in the earth which is used as a fuel
29. nonrenewable: not able to be replaced; being used up faster than it can be formed
30. nuclear: energy form that is freed by changes in the center of an atom
31. particles: small pieces
32. petroleum: a dark, oily liquid found at places in the earth's upper layer, formed by decaying plant and animal life, and made into gasoline and other products
33. pollute: to make dirty or unclean
34. population: the number of people in a place
35. power: force used to do work
36. recycle: to use again and again
37. reserves: something kept back or stored up, to be used at a later time

38. resource: something that lies ready to be used
39. solar: having to do with the sun
40. source: the beginning of something; where it comes from
41. turbine: an engine or motor driven by the pressure of steam, water or air; usually used to make electricity
42. uranium: a material found in nature which can be used to make atomic energy
43. utility: a company which provides services for people, such as electric power, gas, water, or telephone
44. watt: a measure of electricity

Interim Performance Objective: The student will demonstrate his knowledge of what energy "is" and how it is produced. Given a list of activities, the student will write next to each the name (from a given list) of the energy or fuel he and his family would use to perform each. Some energy and/or fuel terms may be used more than once. Compliance factor: 70%.

NAME _____ DATE _____

Write the name of the type of energy or fuel you and your family would use for each of the activities listed below. Choose the types from the following: natural gas, food, sun, gasoline, soil, electricity, wood or charcoal. You may use some types more than once.

ACTIVITIES	ENERGY OR FUEL
1. grow plants	1. _____
2. throw a ball	2. _____
3. ride in a car	3. _____
4. watch TV	4. _____
5. cook food in the kitchen	5. _____
6. cook out of doors	6. _____
7. ride a bike	7. _____
8. keep food in the refrigerator	8. _____
9. use your washing machine	9. _____
10. TAKE THIS TEST	10. _____

Interim Performance Objective: The student will recall that our use of finite energy sources (fossil fuels and uranium) is limited and possibly harmful to the environment through irresponsible utilization of these fossil fuels. Given ten multiple choice statements, the student will select the answer which best completes each statement. Compliance factor: 80%.

NAME _____ DATE _____

Choose the answer which best completes each statement. Circle the letter before your choice.

1. Fossil fuels are

   a. uranium and carbon
   b. solar, nuclear, tidal
   c. petroleum, natural gas, coal
   d. natural gas, gasoline, fossils

2. Our resources of fossil fuels may run out in about

   a. 4000 years
   b. 10-20 years
   c. 1000-5000 years
   d. 15-300 years

3. All types of energy will cost more in the future because

   a. they are becoming scarce
   b. we have so much of them
   c. they are hard to mine
   d. they are no longer needed

4. The type of mining most harmful to the land is

   a. shaft mining
   b. strip mining
   c. shale mining
   d. stream mining

5. Oil which leaks from a ship or pipeline causes

   a. a mess
   b. a blowout
   c. an accident
   d. an oil spill

6. When extra heat is released into a body of water it may harm

   a. animals
   b. fish and plant life
   c. ships
   d. the water

7. Small pieces of soot in the air given off when coal or oil are burned are called

   a. particulate matter
   b. the environment
   c. fog
   d. an invasion

8. One reason why we are facing an energy crisis is

   a. cost of fuels
   b. we have too much
   c. too many automobiles
   d. our present energy sources are nonrenewable

9. When coal and oil are burned, the sulphur in them goes into the air. This sulphur releases into the atmosphere

   a. poisonous gases
   b. fuel
   c. clouds
   d. rain

10. Pollution caused by "waste" heat in the environment is called

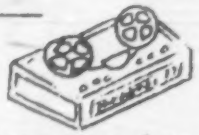
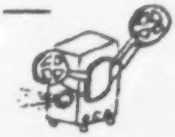
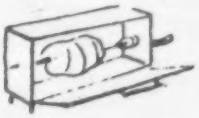
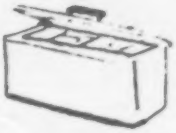
    a. air pollution
    b. water pollution
    c. thermal pollution
    d. land pollution

RESEARCH SURVEY #1

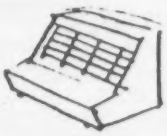
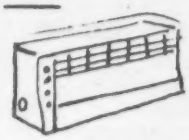
Part 1

On the following pages you will find pictures of energy users in your home. The first picture shows a TV set. If you have a TV in your home draw a circle around the picture. If you have more than one of any energy user, place the numeral which tells how many you have on the line to the side of each picture. If you have any energy users which are not shown, list or draw a picture of them and add them to your survey sheet. Plan with your teacher as to the date when survey information should be brought to class.

ENERGY USES

___ television	___ radio	___ record player - stereo	___  tape recorder
___  movie projector	___ corn popper	___  broiler	___ fry pan
___ toaster	___ coffee maker	___ mixer	___ deep fat fryer
___ liquifier or blender	___ electric casserole	___ refrigerator	___ kitchen stove
___ roaster	___ grill	___ waffle iron	___  freezer

___ knife sharpener	___ garbage disposal	___ dishwasher	___ bottle warmer
___ electric knife	___ hair dryer	___ electric toothbrush	___ electric can opener
___ shaver	___ electric blanket	___ heating pad	___ lamp
___ sun lamp	___ automatic thermostat	___ sewing machine	___ electric workshop tools
___ vacuum cleaner	___ floor polisher	___ washer	___ dryer

___ iron	___ water heater	___ garage door	___ lawn mower
___  space heater	___  air conditioner	___ fan	___ dehumidifier

RESEARCH SURVEY #1

Part 2

Using your Survey Sheet #1 which shows the energy users in your home, place each under the job they do. One example is done for you.

LIGHT	HEAT	WORK	COMMUNICATION	OTHERS

Part 2 (continued)

LIGHT	HEAT	WORK	COMMUNICATION	OTHERS

YOUR CHOICE

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.

In the boxes opposite, list twelve of your favorite items in your home which need electricity to run.

If there were a law passed which said you had to use less electricity, draw a line through the three (3) items which you could really do without.

Circle the three (3) which really mean the most to you and which you would hold on to until the very end.

Look back over your list and your choices and think:
Why did you decide to do without the three (3) items? _____

_____

_____

_____

_____

Why did you want to keep the other three (3) items? _____

_____

_____

WATTAGE CHART

Using your picture survey sheet, your choice sheet, and the chart on this page, see if you can answer these questions:

1. How much electricity do your three important items under "Your Choice" use? _____

2. How much electricity do your three crossed through items use?

_____

3. What items would you give up if you had to save 800 kilowatts a year? _____

_____

_____

4. The high energy users are those which produce:

   a. light

   b. heat and cold

   c. sound

5. Look back at your answers for number 1. How would your way of living change if you had to give up using these items?

_____

_____

	Kilowatts used yearly
Water heater	4,219
Air conditioner (room)	1,389
Refrigerator	1,217
Freezer	1,195
Range (stove)	1,175
Clothes dryer	993
Television (color)	502
(B & W)	362
Dishwasher	363
Microwave oven	300
Attic fan	291
Roaster	205
Frying pan	186
Portable heater	176
Window fan	170
Iron	144
Fan	138
Radio/record player	109
Coffee maker	106
Washing machine	103
Radio	86
Toaster	39
Waste disposal	30
Clock	17
Floor polisher	15
Blender	15
Hair dryer	14
Mixes	13
Sewing machine	11
Knife	8
Shaver	1.8
Toothbrush	0.5

POST-TEST

I. Place the number of the item in Column II before the correct item in Column I.

Column I	Column II
_____ energy	1. uranium
_____ pollute	2. energy from the sun
_____ conservation	3. heat produced in places having hot springs and geysers
_____ coal gasification	4. the ability to do work
_____ atomic energy	5. hydroelectric power
_____ solar	6. using our most plentiful fossil fuel by changing this fuel from a solid to a gas
_____ more efficient use	7. not able to be replaced at the rate they are being used
_____ falling water	8. one way of conserving energy
_____ geothermal power	9. petroleum, natural gas, coal
_____ burning of waste materials	10. the act of protection from harm, loss, waste
_____ nonrenewable	11. a problem caused when man makes poor use of nature's gifts
_____ fossil fuels	12. way of making electricity using garbage or trash as a fuel

II. Make a list or drawing of at least five (5) energy saving actions: three (3) you are practicing at home and two (2) practiced by you and your family in the area of transportation.

At Home

1. _____
_____
_____

2. _____
_____
_____

3. _____
_____
_____

1. _____
_____
_____

2. _____
_____
_____

III. Choose the answer which best completes each statement. Circle the letter before your choice in each statement.

1. The most powerful source of energy is
   a. oil
   b. waterfalls
   c. the sun

2. In the United States the fossil fuel which is the most plentiful is
   a. coal
   b. oil
   c. natural gas

3. One problem with the use of fossil fuels is
   a. waste
   b. a great supply
   c. pollution
4. Energy from fossil fuels is expensive because they are
   a. filled with gases
   b. nonrenewable
   c. hard to mine
5. One way of conserving energy is to
   a. demand more
   b. stop using so much
   c. drill for more oil
6. If you discovered a geyser in your back yard you might be able to heat your home using
   a. geothermal energy
   b. solar energy
   c. atomic energy
7. A liquid fuel used in cars is called
   a. gas
   b. petroleum
   c. gasoline
8. Energy conservation begins with
   a. Mother
   b. the government
   c. me

ANSWER KEY - PRE-TEST

4.6.1 (pp. 11-12)

I. 1. 5
2. 7
3. 3
4. 9
5. 10
6. 1
7. 6
8. 4
9. 2
10. 8

II. a. coal
b. oil
c. natural gas

III. (any of these)
a. fusion
nuclear
atomic
b. tidal
c. geothermal
d. solar
e. burning waste materials
f. coal gasification

IV. Home - turning off lights, conserving hot water, not using unnecessary appliances or the like
Transportation - walking or riding your bike, car pooling to Little League or other activities, urging parents to observe speed limits, or the like

ANSWER KEY - CRITERION MEASURES - INTERIM PERFORMANCE OBJECTIVES

4.6.1.1 (p. 25)

One answer meets measure for each matching item.

1. sun, soil
2. food
3. gasoline
4. electricity
5. natural gas, electricity, wood
6. charcoal, wood
7. food
8. natural gas, electricity
9. natural gas, electricity
10. food

4.6.1.2 (p. 35)

2
3
4
1
5

4.6.1.3 (pp. 46-47)

1. c
2. d
3. a
4. b
5. d
6. b
7. a
8. d
9. a
10. c

4.6.1.4 (p. 69)

1. F
2. T
3. T
4. T
5. F
6. T
7. T
8. F
9. T
10. T

4.6.1.5 (p. 79)

2
3
5
1
4

4.6.1.6 (p. 94)

Answers are the same as those for Pre-test, Part IV and Post-test, Part II.

ANSWER KEY - POST-TEST

4.6.1 (pp. 11-12)

I. 1. 4
2. 11
3. 10
4. 6
5. 1
6. 2
7. 8
8. 5
9. 3
10. 12
11. 7
12. 9

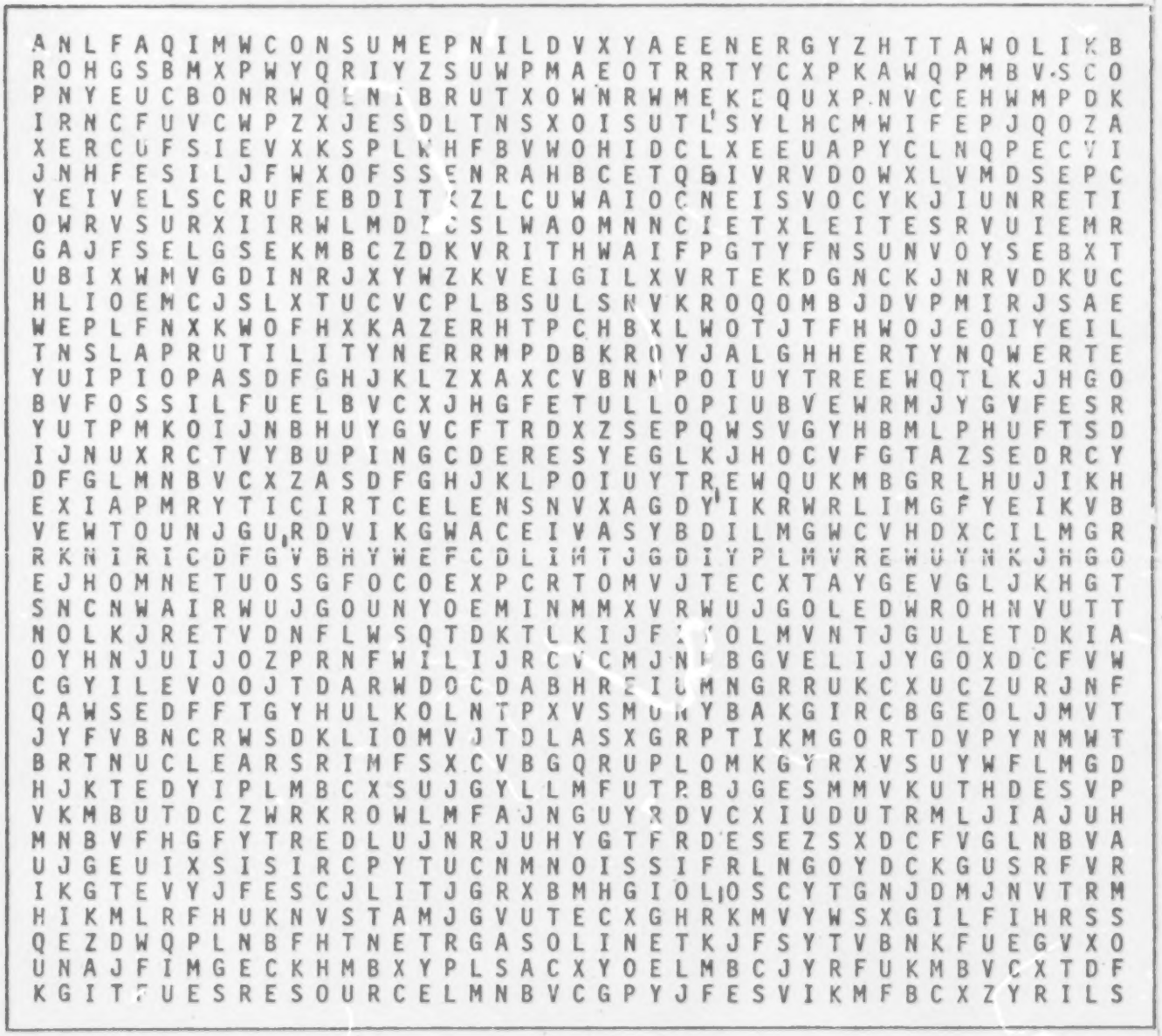
II. Answers are the same as Pre-test, Part IV.

III. 1. c
2 a
3. c
4. b
5. b
6 a
7. c
8. c

SUPPLEMENTAL ACTIVITIES AND RESOURCES

SEAMLESS ENERGY PUZZLE

Hidden in this puzzle are the 46 terms listed at the bottom of the page. The terms read forward, backward, up, down or diagonally. Draw a line around each as you find it, then check it off with the list.



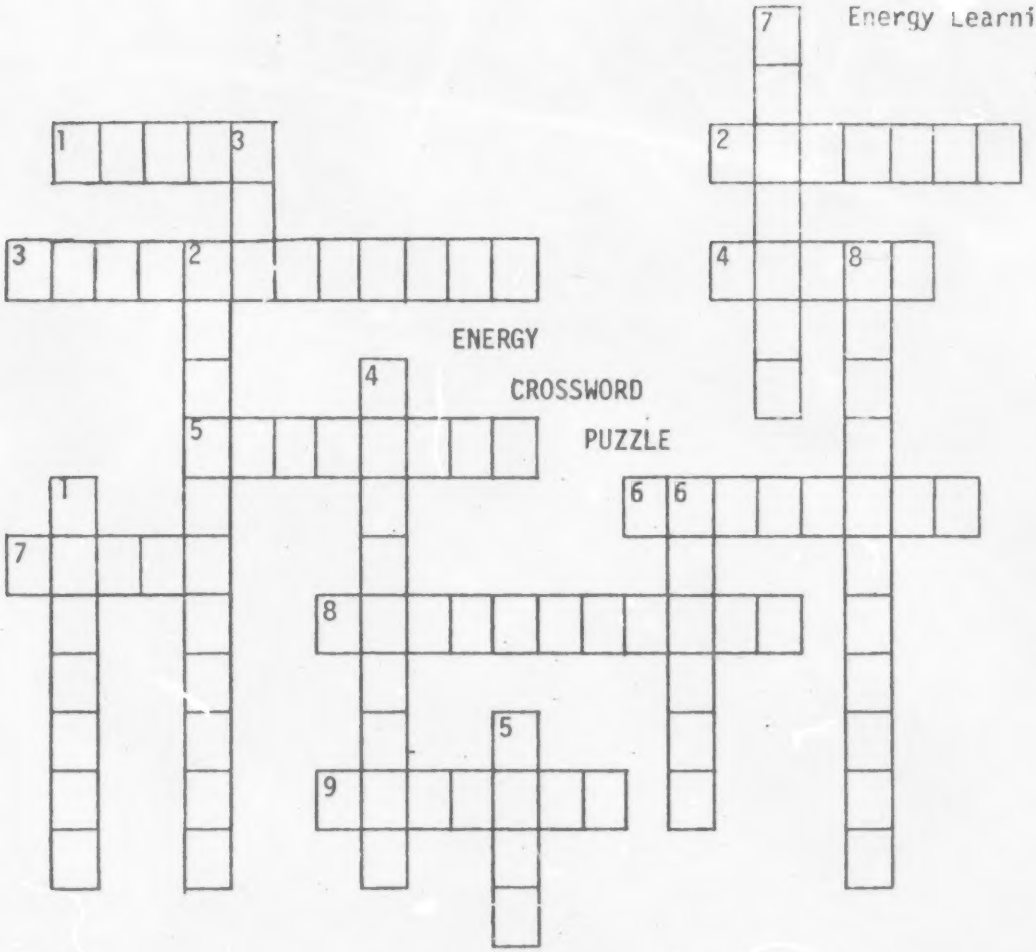
1. aluminum
2. appliance
3. atomic
4. conserve
5. consume
6. crisis
7. ecology
8. efficient
9. electricity
10. energy
11. environment
12. fission
13. food
14. fossil fuel
15. fuel
16. fusion
17. gasoline
18. geothermal
19. generator
20. geyser
21. harms
22. harness
23. heat
24. hydroelectric
25. kilowatt
26. machine
27. natural gas
28. nonrenewable
29. nuclear
30. particles
31. petroleum
32. pollute
33. population
34. power
35. recycle
36. reserves
37. resource
38. solar
39. source
40. sun
41. [illegible]ine
42. [illegible]ium
43. utility
44. watt
45. wood
46. work

(80)

SEAMLESS ENERGY PUZZLE

Answer Key

```
- N - - - - - - - C O N S U M E - - - - - - - - - - E N E R G Y - - T T A W O L I K -
- O - - - - - - - - - - - - - - - - - - - - E - - R - - - - - - - - - - - - - - - -
- N - E - - - - - - - - E N I B R U T - - - N - - - E - - - - - - - - - - - - - - -
- R - - F - - - - - - - - - - - - - - - - - I - - - - S - - - - - - - - - E - - - - - -
- E - - - F - - - - - - - - - - - - - - - - H - - - - - E - - - - - - - - N - - - - - -
- N - - - - I - - - - - - - - S S E N R A H - C - - - E - - R - - - - - - - V - - - - - C
- E - - - - - C - - - E - - - - - - - - - - - A - - C - - - - V - - - - - I - N - - - I
- W - - - - R - I - - - L - - - - - - - - - - - M - N - - - - - - E - - - - - R - U - - - R
- A - - - E - - - E - - - C - - - - - - - - - - - A - - - G - - - - - S - - - O - S - - - T
- B - - W - - - - - - N - - - Y - - - - - - - - I - - - - - E - - - - - - - - N - - - - - - C
- L - O - - - - - - - - T - - - C - - - - - - L - - - - - - - - O - - - - - - - M - - - - - - E
- E P - - - - - - - - - - - - - - - - E - - - P - - - - - - - - - - T - - - - - - E - - - - - - L
- - - - - - - - U T I L I T Y - - - R - P - - - - - - - - - - - - - H - - - - - N - - - - - - E
- - - P - - - - - - - - - - - - - - - - - - - - A - - - - - - - - - - - - - - - E - - - T - - - - - - O
- - F O S S I L F U E L - - - - - - - - - E T U L L O P - - - - - - - R - - - - - - - - - R
- - - P - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - S - - - - - - M - - - - - - - D
- - - U - - - - - - - - - - - - - - - - - - -
```



Across

1. What pollution does to the environment
2. To make dirty or unclean
3. Not able to be replaced
4. Force used to do work
5. To save
6. Something that meets a need
7. From the sun
8. Petroleum, coal, natural gas
9. Power from the atom

Down

1. To use
2. Form of energy most used in our homes
3. Plants use its light to make food
4. "Oil"
5. A form of energy which causes a body to rise in temperature
6. The ability to do work
7. The interrelationships of living things to one another and to their environment
8. All those things which surround us

ANSWER KEY TO

ENERGY CROSSWORD PUZZLE

Across

1. harms
2. pollute
3. nonrenewable
4. power
5. conserve
6. resource
7. solar
8. fossil fuels
9. nuclear

Down

1. consume
2. electricity
3. sun
4. petroleum
5. heat
6. energy
7. ecology
8. environment

83

ENVIRONMENTAL EDUCATION OF FIFTH GRADE OBJECTIVES

1. Man makes all of the changes in the composition of our soil.
   Yes No Don't Know

2. The soil is the same all over the world
   Yes No Don't Know

3. Color, texture, smell, and pH help determine the chemical and physical make-up of soil but are of little value to the farmer and nursery-man.
   Yes No Don't Know

4. Erosion does not concern the people who live in the city but is a big problem for those who live in the country.
   Yes No Don't Know

5. Everyone of us can be a part of more than one environment.
   Yes No Don't Know

6. The three basic requirements for life are water, air, and fire.
   Yes No Don't Know

7. Man is not dependent upon his environment in order to survive.
   Yes No Don't Know

8. Man is forever changing his environment for the good of himself and his descendents.
   Yes No Don't Know

9. Technology will always be able to solve man's problems and insure his survival on the earth.
   Yes No Don't Know

10. The earth's resources are unlimited and will last forever.
    Yes No Don't Know

11. Over population is not a problem because we still have plenty of uninhabited land left in the world.
    Yes No Don't Know

12. Pollution is not a problem yet because we can always lower our standards a little more to take care of the increases for the next few years.
    Yes No Don't Know

13. When we run out of fossil fuels we can always change over to electricity
    Yes No Don't Know

14. Renewable resources are being used faster than they can be replaced.

Yes No Don't Know

15. There is no need to worry about conservation because the Federal Government will pass a law and take care of all of our energy and resource problems any day now

Yes No Don't Know

16. Overpopulation is really not a big problem because all we need to do is build more houses and grow more food.

Yes No Don't Know

17. Government and religion are the two most important factors which determine the development of a nation

Yes No Don't Know

19. The average life span of a person in an under-developed country is usually longer than that of a person in an industrialized nation because he lives at a slower pace.

Yes No Don't Know

19. Solar energy is cheap because we can get all the sun-light we need for free.

Yes No Don't Know

20. The world as we know it is here to stay. Explain your answer.

Yes No Don't Know

SEQUENCE

Sixth Grade

Objectives:

1. To understand man's responsibilities for use and management of his environment.
2. To develop additional understandings of natural resources needed to apply conservation practices.
3. To learn how different cultures relate to their environment.
4. To learn what your government is doing to help protect and conserve natural resources.
5. To understand the need to use ecological principles as guides for conservation action.
6. To continue to develop understandings of how natural environment contributes to the creative arts.

SIXTH GRADE

OBJECTIVE I

To understand man's responsibilities for use and management of his environment.

Activity:

Discuss the booklet "Working Together For A Livable Land" using the provided Teacher's Guide.

Materials:

Booklets provided by the Santa Fe Soil Conservation Department

Teaching Suggestions:

Follow the Teacher's Guide which has objectives, core concepts, key words, learning experiences, discussion questions, and suggested activities.

OBJECTIVE II

To develop additional understandings of natural resources needed to apply conservation practices.

Activity:

Film "The Eternal Forest"

Materials:

Order free film from: Forest Education Bureau, Collins Building, Tallahassee, Florida 32304

Teaching Suggestions:

After viewing film as questions such as: Is man's relationship with his environment changing? Why? Can these changes be planned?

This film traces the relationship between man and his environment, it begins with our bountiful heritage and ends with man realizing he can no longer take without returning.

Activity:

Lesson on Conservation of Natural Resources

Materials:

Branch of a tree

Teaching Suggestions:

Bring to class a small branch from a tree (if possible, from a tree in the school yard).

Ask The Class:

What do I have?
What would have happened if all of you had broken a branch from the the same tree this morning?
What if everyone in the school had broken a branch from the same tree?
What if each of us had cut down a tree this morning?
What are our basic natural resources? (Forest, soil, water, wildlife, minerals)
Can anyone think of some ways we destroy our natural resources?

Ask pupils to think about this last question for a few minutes. Have one student write on the board a list which various members of the class will give him. They might include: forest fires, wasting water, polluting water, clearing forests and not replanting, allowing land to erode, and many more.

Does anyone know a word which means "to take care of our natural resources?" (Conservation)

What are some ways we can conserve our natural resources?
Does our community, city, state, or federal government do anything to conserve our natural resources?

After these questions have been discussed, tell the class to think about what they can do to help in the conservation effort.

Go over Ecology's Ten Commandments.

OBJECTIVE III

To learn how different cultures relate to their environment.

Activity:

Scan Social Studies book for pictures showing clothing and houses.

Materials:

Social Studies book, pencil and paper.

Teaching Suggestions:

Explain to the class that peoples clothes and styles of houses are related to their environment.
Examples such as these could be observed:

1. loose, flowing garments worn by desert people
2. lightweight clothes worn by tropical inhabitants
3. pitched roofs where snow falls
   flat roofs in tropical areas
4. Eskimo igloos and fur clothing

OBJECTIVE IV

To learn what your government is doing to help protect and conserve natural resources.

Activity 1:

Newspaper and Periodical Research Materials: Old papers and magazines

Teaching Suggestions:

Have the students bring newspapers and periodicals to class and then start looking for articles relating to our government and its role in protecting and conserving natural resources.(Library subscriptions Env. report from National Wildlife Fed.)

Activity 2:
Writing letters

Materials:

Envelopes and stationary

Teaching Suggestions:

Students can write letters to : U.S. Environmental Protection Agency,
1421 Peachtree Street, N. E.
Atlanta, Georgia, 30309

Attention: Director of Public Informantion and Legislators, U.S. and State Agencies

in order to receive information on the government's role in protecting and conserving natural resources.

Activity 3:

Discuss the 5th Environmental Quality Indes with your class.

Materials:

Copies of the Index are available from: National Wildlife Federation
1412 16th Street N. W.
Washington, D. C. 20036

79865TA	25 - 49 copies EG @ .15	each
79874TA	50 - 99 copies Eg @ .12	each
79883TA	100 -499 copies Eg @ .11	each

Teaching Suggestions:

Discuss Air and Water Pollution. Students will be able to work with graphs on pages 2, 3, and 4.

Article on The Politics of Pollution will open up a lot of class discussion.

Decide on local level who makes decisions concerning you and your environment. (County Comm., City Comm., or other officials)

Play Roles
Co. Plan
Present Problem

OBJECTIVE V

To understand the need to use ecological principles as guides for conservation action.

Activity 1:

The Web of Life

Materials:

Ball of string, magic marker, or crayon, scissors, name cards (4 x 12)

Teaching Suggestions:

Players form a circle. Each player is given a "name" card which identifies him as some part of the environment and man-made things. The leader gives the sun one end of the string and then unwinds the string from one person to the next, crisscrossing, across the circle. As each player is connected, ask the group why the connection is important in the environment.

The leader then cuts the string between any two people "asking what would happen to the web with this string unbroken. This can be traced back to the sun.

Activity 2:

The Food Chain

Materials:

Name cards

Teaching Suggestions:

Players form a circle. Players are given a "name" card. This identifies him as a certain kind of animal or plant. The leader stands in the middle with the name card, "man" and, starting with the plant, asks each player to hold hands with the player on his left. As each player holds hands, ask the group how these two parts of the environment are connected or dependent on each other. After all players are holding hands, ask them to lean backwards as far as they can without falling over. Then, without warning, the leader breaks the hand hold of two players, causing the group to fall over backwards. This shows the entire food chain was unbalanced when one link was broken.

OBJECTIVE VI

To become aware how the natural environment serves as inspiration for the creative arts.

Activity:

Field trip to art museum at University of Florida or Lake City Community College.

Materials Needed:

Teaching Suggestions:

Visit an art gallery or museum to learn how painters and sculpturs use natural resources as inspiration for their works.
Listen to records and tapes to show how music can interpret the environment
Field Walk: Write a song or poem that describes some aspect of the natural environment.

Activity:

(Cinquain) and art
Drawing pictures using natural surrounding for colors. (example: leaves - green; bark - brown; and etc.)

Materials:

Paper and pencil for each student

Teaching Suggestions:

Take the class out in the school yard and have them draw a picture of some aspect of the natural environment using articles of the surroundings as a source of color. After the picture is completed, have the students to write two adjectives describing the way it looks; then 3 verbs describing the way it moves; then a phrase describing its relationship to the general area around it; and one word describing your feelings about the object you drew.

ENVIRONMENTAL EDUCATION OF SIXTH GRADE OBJECTIVES

1. Water is one of the natural resources that we don't have to worry about, because our cities provide us with plenty.
   Agree Disagree

2. Individuals don't need to worry about pollution because labor factory's cause most of our pollution.
   Agree Disagree

3. We do not need to worry about replanting our trees as we cut them because nature replaces them.
   Agree Disagree

4. We should not be concerned with the use of our natural resources because there are still plenty of them available.
   Agree Disagree

5. If you have a candy wrapper to throw away, you should look for a dirty area before throwing it on the ground.
   Agree Disagree

6. Man is a prisioner of his environment.
   Agree Disagree

7. Man's life-styles, clothing, and architecture are determined agreat deal by his environment.
   Agree Disagree

8. We do not need laws on conservation at a federal level because it is a local problem.
   Agree Disagree

9. Floridians should not be concerned with the smog proglem of Los Angeles and Pittsburg because it does not affect them.
   Agree Disagree

10. We should not be concerned about a species of an animal dying out because it can't be helped.
    Agree Disagree

RESOURCE LIST

SUGGESTED FOR USE OR PURCHASE

BY

MEDIA CENTERS

COLUMBIA COUNTY ENVIRONMENTAL WRITING WORKSHOP

JUNE

1975

1. An interdisciplinary outdoor education program
Outdoor Education
Shoreline School District No. 412
Northeast 158th and 20th Ave. N. E.
Seattle, Washington 98155

2. Beauty-in-change-succession
Lee County Schools

What is tree worth to you?
Lee County Schools

Urban forestry
Lee County Schools

3. Proceedings
Conducted at the Taylor County Resource - use outdoor Education Center
Perry, Florida-Jim Phillips

4. Environmental Fiucation Excursions - a guide for teachers grade 4
Floyd H. Clark
Highlands County
Environmental Education Rep. and E.E. Projects Director
Sebring , Florida 33870

5. Interdisciplinary Environmental Ed. Activities
Draft
Ernest E. Burgess Jr.
Dept. fo Ed.
Tallahassee, Fla.

6. W A Y S to environmental Ed. of the Tallahassee Junior Museum
Sam W. Kates Director
Tallahassee Junior Museum
3945 Museum Dr.
Tallahassee, Florida 32304

7. Interdisciplinary-on campus environmental activities
School Board of Polk County, Florida

8. Invite Wildlife to your backyard
National Wildlife Federation
Dept. B H 75
1412 16th St. N. W.
Washington, D.C.

9. Environmental Exchange a beginning
PEMAP
information to enroll class, club or school in program
Ms. Joan Donnelly
The President's Encironmental Protestion Agency
401 M Street S. W.
Washington, D. C. 20460

10. On campus teaching activity guide
Environmental Ed.
Lee County Schools

"Meecology" 16mm (free film)
Modern Talking Picture Service
233 New Hyde Park Rd.
New Hyde Park, N. Y. 11040

"Sandspur" newsletter about $4.00
Florida Audubon
P. O. Drawer 7
Maitland, Florida 32751

Envirnmental Education Strategeis for wise use of energy
Division of Science Ed.
North Carolina Dept of Public Instruction
Raleigh, N. C. 27611

Options-a study guide to population and the American future
The population Reference Bureau, Inc.
1755 Massachusetts Ave. N. W.
Washington, D. C. 20036

Environmental Awareness Activities K-3
School Board of Hillsborough County, Fla.

Ecology Primer-$1.45
How many are too many?-$1.25
The unseen enemy-$.95
Our troubled waters $.95
The body breakers-$1.25
Our troubled waters-$.95
Our wounded land $.95
Mist of death-$.95
The world's exhaust-$.95
Pendulum Press, Inc.
West Haven, Conn. 06516

It's our choice and teachers guide $3.00 each or $2.25 for 10 or more
Vick Knight, Jr.
Gloge Book Co. Inc.
175 Fifth Ave.
New York, N. Y. 10010

It's our world and guide
It's our island and guide
It's our future and guide

The pine jog guide to environmental study
Pine Jog Environmantal Sciences Center
Summit Boulevard and Jog Road
West Palm Beach, Fla. 33406

Ecology with teachers guides
The oceans and Man
The Forest
The grassland
The city
The Suburbs
The mountains
The Deserts

The oceans
The Fresh water
George McCue
Benziger Web of Life Books
Benziger, Inc.
All teachers ed. by C. Richard Tillis

0. "Songsof thy works" 16 mm contact Jim Phillips

1. Florida 10 million $4.00
Division of State Planning
Department of Administration
Tallahassee, Florida 32301

2. "Earth lessons" 16mm contact Jim Phillips

3. E Q Index - $4.00 each and min. order of $12.00
National Wildlife Federation
1412 16th St. N. W.
Washington, D. C. 20036

4. Limits to growth $2.75
Donella H. Meadows
Dennis L. Meadows
Universe Books

5. Outdoor activities for environmental studies
Clifford E. Knapp
The Instructio Publications, Inc.
Dansville, N. Y. 14437

6. Bulletin boards for environmental studies
Dr. Clifford Knapp
The Instructor Publications, Inc.
Dansville, N.Y. 14437

7. Mini-lessons for environmental awareness curriculum
Union County Schools
Lake Butler, Florida
James H. Cason, III, Superintendent of Schools

RESOURCE PEOPLE

Game & Fresh Water Fish Commission	-	Larry Rosignol, Steve Stafford
Osceola National Forest		
Florida State Forestry Service	-	Smoky
Department of Transportation	-	Leroy Irvin (ecologist)
Zoning Board Member	-	Tommy Ives
Bicentennial Committee Member	-	Nettie Ozark
LCCC	-	Frank Sedmera
Owens Illinois	-	Fred Whitaker
" "	-	David Stevenson (forester)
Environmental Education Consultant	-	Jim Phillips
State Dept. of Education		
U.S. Dept. of Agricultural Research	-	Carl Fatsinger (PHD)
Olustee	-	Carlyle Franklin
Retired Park Director	-	Carlos Maxwell (Ft. White)
U.S. Forest Service-Olustee	-	Bill Peters
County Agent	-	Neal Dukes
Florida State Div. of Forestry	-	Dave Young (weather)

LIST OF FREE AND INEXPENSIVE INSTRUCTIONAL MATERIAL

National Park Association
1701 18th Street N.W.
Washington, D.C. 20036

Pamphlets on all forms of pollution and on many aspects of Ecology, Free or Low Cost.

Conservation Foundation
1250 Connecticut Avenue N.W.
Washington, D.C. 20036

Pamphlets and articles on every aspect of ecological Studies.

Sierra Club
1050 Mills Tower
San Francisco, Calf. 94104

Literature on pollution, overpopulation, protection of scenic areas, and other topics.

Canadian Audubon Society
46 St. Clair Avenue East
Toronto 7, Ontario, Canada

Education Programs on our need to manage the environment on sound ecological principle.

Energy & Man's Environment
2121 Fifth Avenue
Seattle, Washington 98121

Nuclear Power and The environment
American Nuclear Society
244 East Ogden Avenue
Hinsdale, Illinois 60521

Lee County Schools, Environmental Education Program
E.S.E.A. Title III
2266 Second Street
Fort Myers, Florida 33901

Activity Module K-6

Environmental Education instructional Activities
New York State Education Dept.
Albany, New York

Soil Conservation Service Publication

Audiovisual Teaching Aids

An outline for teaching conservation in Elementary School.
U.S. Dept. Agricuture - Soil Conservation Service PA-268

AUDIO VISUAL MATERIALS FOR ENVIRONMENTAL EDUCATION

Prepared from materials available at Summers Media Center and County Regional Film Library. Many of these materials are available in all media centers in the county.

KEY

Film - 16 mm films from Film Center

C-Film - 8 mm loop films from Film Center

FS - Filmstrip

FSR - Filmstrip with record

FSC - Filmstrip with cassette

Pic - Picture

CFL - 8 mm loop film (silent)

Trans - Transparencies

SP - Study Prints

Rec - Record

AIR		
Film	551.5	Air and What It Does P-I
FS	551	The Earth and its Wonders: The Story of Air
ALGAE		
Film	586	Plants That Have No Flowers or Seeds I-J
ANIMALS		
Film	591	Animals at Work in Nature P-I
FS	591.92	Animals of Sea and Shore P
Pic	636	Animals that Help Us
Film	591	Common Animals of the Woods P-I
FSR	590	Kingdom of the Animals
FS	590	How Animals Live P
Pic	591	Animal Homes
FS	591	Exploring the Animal World: Farm Animals, Animal Babies, Animal Differences, Tame Animals
AQUARIUMS		
Film	590.74	A Balanced Aquarium P-I
FS	574.92	Life in an Aquarium I-J
ATMOSPHERE		
FSR	551.51	Earth's Blanket of Air
FS	551.5	The Ocean of Air We Live In I
FSR	551	Our Earth: Land, Water, and Air
BEHAVIOR		
FSC	387.7	The Adventures of the Lollipop Dragon Avoiding Litter Care of Property How the Lollipop Dragon Got His Name Kindness to Animals Taking Turns Working Together
BIRDS		
Film	598	Birds and Their Homes P-I
Film	598	Birds Are Interesting I
Film	598	Birds: How They Live, Where They Live P-I-J
Film	598	Flight of Birds I-J-H-C
FS	598.2	Fun Watching Birds I-J
CFL	598	Shore Birds: Wading and Feeding Behavior
Film	598	The Winged World - Instinct and Intelligence in Birds
Film	598	The American Bald Eagle I-J-H-C-A
BOTANY		
FS	910.02	The Desert I-J

Film	631.8	Making the Most of a Miracle I-J-H
FS	910.02	Meditterranean Lands I
FS	910.02	Mid-Latitude Grass-lands I
FS	910.02	Mid-Latitude Lands of Four Seasons I
FS	910.02	Northern Forest Lands I
FS	910.02	Tropical Rain Forest I
Trans	580	Plants
Film	586	Plants That Have No Flowers or Seeds I-J

BUTTERFLIES

FS	595.7	Caterpillar to Butterfly I-J
CFL	595.7	Monoarch Butterfly
Film	595.78	Monoarch Butterfly Story P-I-J-H-C
Pic	595.7	The Life Cycle of a Monarch

CLIMATE

SP	910	Climates of the World
FS	574	How Climate Affects Our Lives I
FS	910.02	Polar Lands of the Arctic I-J

See Also: Botany

CONSERVATION

Trans	333.7	Conservation
FS	333.72	Conservation - Your Stake in the Future I

DESERTS

Film	574.9	Life in the Desert I
Film	916.1	Life in an Oasis - North Africa I-J
FS	551.4	The Worlds Dry Lands I

EARTH

FS	550	The Earth - A Great Storehouse
Film	551	The Earth in Change I-J
Film	551	Face of the Earth I-J-H-C-A
FS	551.1	Surface of the Earth I
CFL	919.69	A Volcano in Action
FS	525	What is the Earth Made Of? P
FS	551	The Earth and Its Wonders: Internal Structure

ECOLOGY

Film	598	The American Bald Eagle I-J-H-C-A
FS	574.4	Balance Among Living Things I
Film	301.3.	Boomsville P-I-J-H
Film	574	Distribution of Plants and Animals H
Film	574.	The End of One P-I-J-H-C-A
Film	301.32	Population Ecology H-C
Film	301.3	What is Ecology? H
FSR	301.31	Dash McTrach and the Pollution Solution: 5 filmstrips
Film	301.3	Litter, Litter Everywhere K-P-I
FSR	574.5	Communities in Nature Animals in a Community Green Plants in a Community

		Energy Flow in a Community
		Living Things
		Living Things Adapt to Each Other
		Living Things Adapt to their Environment
		Living Things Form Communities
		Scavangers and Decomposers in a Community
SP	614	Keeping the City Clean and Beautiful - 9 prints
SP	300	Interactions of Man & His Environment
SP	300	Interactions of Man & His Resources
FOOD		
Film	910	Food, Clothing, and Shelter in Three Environments I-J-H
FS	338.1	Supplying Food For Our Cities I
FS	641	Food Comes From Many Places P
FOSSILS		
Film	568	The Dinosaur Age I-J-H-C
FRESH WATER BIOLOGY		
Film	574.92	The Fresh Water Pond I-J
GEOLOGY		
Model	551	Land Form Models
Film	551	The Earth in Change I-J
FS	550	The Earth - A Great Storehouse
Film	551	Face of the Earth I-J-H-C-A
Film	551.4	Face of the High Artic I-J-H-C-A
Trans	551	Geology
FSR	551.11	Our Earth: Land, Water, and Air
CFL	919.69	A Volcano in Action
FS	551	The Earth and its Wonders: Story of Ice and Glaciers and 5 others
MINERALOGY		
FS	622	Digging For the Earth's Treasures
FS	622	Rocks, Minerals and Mining (6 filmstrips)
Film	549	Treasures of the Earth I
NATURAL RESOURCES		
FS	333	Natural Resources: Coal, Oil, Natural Gas
NATURE STUDY		
C Film	574	Grass-Blade Jungle J-H
OCEAN		
Film	551.4	Oceanography - Science of the Sea I-J-H
Trans	551.4	Oceanography
FS	551.4	The Seas About Us I-J
Film	551.4	The Ocean: A First Film P-I
POPULATION		
Film	301.3	Boomsville P-I-J-H

C Film	301.3	Can the World Be Fed? J-H-C
POWER		
FS	621	Man's Use of Power Through the Ages I-J
Film	621	We Use Power I
SEASHORE		
Film	591.92	We Visit the Seashore P-I
SEASONS		
Film	525	Causes of the Seasons I-J
Film	525.5	Children in Autumn P-I
Film	525.5	Children in Spring P-I
Film	525.5	Children in Summer P-I
Film	525.5	Children in Winter P-I
FS	525	The Earth is Always Changing
FS	525	The Four Seasons
FSR	525	Learning About the Seasons
Film	796.9	Play in the Snow P-I
Rec	E	The Little Island
WATER		
FS	551	The Earth and Its Wonders: Story of Underground Water
FS	551.4	How Does Water Get Into the Air?
WEATHER		
Trans	551.59	Weather
FS	551.59	Weather
FS	551.59	Building a Classroom Weather Station I
Pic	551.5	Cloud Formations
FS	551.59	A Foggy Day, a Windy Day P-I
FS	551.5	Understanding Weather Conditions I
Film	551.5	Water in the Air I-J-A
Pic	551.5	Weather Instruments
Pic	551.5	Weather Phenomena
FS	551.59	What is Weather
FS	551.59	What will the Weather BE?

RESOURCE LIST

SUGGESTED FOR USE OR PURCHASE

BY

MEDIA CENTERS

COLUMBIA COUNTY ENVIRONMENTAL WRITING WORKSHOP

JUNE

1975

1. An interdisciplinary outdoor education program
Outdoor Education
Shoreline School District No. 412
Northeast 158th and 20th Ave. N. E.
Seattle, Washington 98155

2. Beauty-in-change-succession
Lee County Schools

What is tree worth to you?
Lee County Schools

Urban forestry
Lee County Schools

3. Proceedings
Conducted at the Taylor County Resource - use outdoor Education Center
Perry, Florida-Jim Phillips

4. Environmental Education Excursions - a guide for teachers grade 4
Floyd H. Clark
Highlands County
Environmental Education Rep. and E.E. Projects Director
Sebring , Florida 33870

5. Interdisciplinary Environmental Ed. Activities
Draft
Ernest E. Burgess Jr.
Dept. fo Ed.
Tallahassee, Fla.

6. W A Y S to environmental Ed. of the Tallahassee Junior Museum
Sam W. Kates Director
Tallahassee Junior Museum
3945 Museum Dr.
Tallahassee, Florida 32304

7. Interdisciplinary-on campus environmental activities
School Board of Polk County, Florida

8. Invite Wildlife to your backyard
National Wildlife Federation
Dept. B H 75
1412 16th St. N. W.
Washington, D.C.

9. Environmental Exchange a beginning
PEMAP
information to enroll class, club or school in program
Ms. Joan Donnelly
The President's Environmental Protestion Agency
401 M Street S. W.
Washington, D. C. 20460

10. On campus teaching activity guide
Environmental Ed.
Lee County Schools

"Meecology" 16mm (free film)
Modern Talking Picture Service
233 New Hyde Park Rd.
New Hyde Park, N. Y. 11040

"Sandspur" newsletter about $4.00
Florida Audubon
P. O. Drawer 7
Maitland, Florida 32751

Environmental Education Strategeis for wise use of energy
Division of Science Ed.
North Carolina Dept of Public Instruction
Raleigh, N. C. 27611

Options-a study guide to population and the American future
The population Reference Bureau, Inc.
1755 Massachusetts Ave. N. W.
Washington, D. C. 20036

Environmental Awareness Activities K-3
School Board of Hillsborough County, Fla.

Ecology Primer-$1.45
How many are too many?-$1.25
The unseen enemy-$.95
Our troubled waters $.95
The body breakers-$1.25
Our troubled waters-$.95
Our wounded land $.95
Mist of death-$.95
The world's exhaust-$.95
Pendulum Press, Inc.
West Haven, Conn. 06516

It's our choice and teachers guide $3.00 each or $2.25 for 10 or more
Vick Knight, Jr.
Gloge Book Co. Inc.
175 Fifth Ave.
New York, N. Y. 10010

It's our world and guide
It's our island and guide
It's our future and guide

The pine jog guide to environmental study
Pine Jog Environmental Sciences Center
Summit Boulevard and Jog Road
West Palm Beach, Fla. 33406

Ecology with teachers guides
The oceans and Man
The Forest
The grassland
The city
The Suburbs
The mountains
The Deserts

The oceans
The Fresh water
George McCue
Benziger Web of Life Books
Benziger, Inc.
All teachers ed. by C. Richard Tillis

"Song of the works" 16 mm contact Jim Phillips

Florida 10 million $4.00
Division of State Planning
Department of Administration
Tallahassee, Florida 32301

"Earth lessons" 16mm contact Jim Phillips

E Q Index - [illegible] $4.00 each and min. order of $12.00
National Wildlife Federation
1412 16th St. N. W.
Washington, D. C. 20036

Limits to growth $2.75
Donella H. Meadows
Dennis L. Meadows
Universe Books

Outdoor activities for environmental studies
Clifford E. Knapp
The Instructio Publications, Inc.
Dansville, N. Y. 14437

Bulletin boards for environmental studies
Dr. Clifford Knapp
The Instructor Publications, Inc.
Dansville, N.Y. 14437

Mini-lessons for environmental awareness curriculum
Union County Schools
Lake Butler, Florida
James H. Cason, III, Superintendent of Schools